

R13

Code No: 126AM

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

REFRIGERATION AND AIR CONDITIONING

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Explain the term "tonne of refrigeration". [2]
- b) Discuss the effect of sub-cooling on COP. Would you desire large sub-cooling and why? [3]
- c) Give the advantages of hermetic sealed compressor? [2]
- d) Differentiate between low-side float valve and high side float valve. [3]
- e) Discuss the function of absorber in vapor absorption refrigeration system. [2]
- f) Under what situation in steam jet refrigeration system recommended? What are its limitations? Can it be used for obtaining sub-zero temperatures? [3]
- g) What do you understand by effective room sensible heat factor? [2]
- h) With the help of psychrometric chart, explain sensible heating and sensible cooling process. [3]
- i) Explain the importance of "throw" and "drop" in locating the grill. [2]
- j) Explain the advantages and disadvantages of viscous filters over dry filters. [3]

PART - B

(50 Marks)

- 2.a) How does the increase in condenser temperature affect COP. Also explain the influence of evaporator temperature on COP. Which of the two temperatures have more influence on COP?
- b) A R-12 refrigerating machine works on vapor compression cycle. The temperature of refrigerant in the evaporator is -20°C . The vapor is dry saturated when it enters the compressor and leaves it in a superheated condition. The condenser temperature is 30°C . Assuming specific heat at constant pressure for R-12 in the superheated condition as 1.884 kJ/kg K , determine:
 - i) Condition of vapor at the entrance to the condenser
 - ii) Condition of vapor at the entrance to the evaporator and
 - iii) Theoretical COP of the machine. [5+5]

OR

- 3.a) What is the difference between a refrigerator and a heat pump? Derive an expression for the performance factor for both if they are running on reserved Carnot cycle.
- b) A vapor compression plant using R-12 operates between 35°C condensing temperature and -5°C evaporation temperature with saturated vapor leaving the evaporator. The plant consists of twin cylinder, single acting compressor with 100 mm diameter and 120 mm stroke running at 300 rpm. The volumetric efficiency is 85% and the mechanical efficiency is 90%. Assuming isentropic compression, determine: [5+5]
- COP
 - Power required
 - Tonnage capacity of the plant.

- 4.a) Describe, with a sketch, a centrifugal compressor. Where are centrifugal compressors preferred over reciprocating compressors in refrigerating system?
- b) Discuss the operation of a capillary tube in a refrigeration system. [5+5]

OR

- 5.a) Explain the dry expansion evaporator with the help of a neat sketch.
- b) What are the points to be considered for selecting a condenser for a refrigeration system? [5+5]

- 6.a) Discuss the advantages of the dense air refrigerating system over an open air refrigeration system.
- b) A dense air refrigerating system operating between pressures of 17.5 bar and 3.5 bar is to produce 10 tonnes of refrigeration. Air leaves the refrigerating coils at -7°C and it leaves the air cooler at 15.5°C . Neglecting losses and clearance, calculate the net work done per minute and the coefficient of performance. For air $C_p=1.005$ kJ/kg K and $\gamma=1.4$. [5+5]

OR

- 7.a) Explain the various components of steam jet refrigeration system and clearly discuss the function of each component; compare the system with vapor compression refrigeration system.
- b) A refrigerating system working on Bell-Coleman cycle receives air from cold chamber at -5°C and compresses it from 1 bar to 4.5 bar. The compressed air is then cooled to a temperature of 37°C before it is expanded in the expander. Calculate the COP of the system when compression and expansion are i) isentropic and ii) follow the law $p v^{1.25}=\text{constant}$. [5+5]

- 8.a) Define room sensible heat factor. How room sensible heat factor line is drawn on the psychrometric chart?
- b) The air at 35°C DBT and 25°C WBT is passed through a cooling coil at the rate of $280\text{ m}^3/\text{min}$. The air leaves the cooling coil at 26.5°C DBT and 50% relative humidity. Find:
- Capacity of the cooling coil in tonnes of refrigeration
 - Wet bulb temperature of the leaving air
 - Water vapor removed per minute
 - Sensible heat factor. [5+5]

OR

R13

Code No: 126AQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

INFORMATION SECURITY
(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- | | | |
|------|---|-----|
| 1.a) | Give various security services. | [2] |
| b) | What are the principles of security? | [3] |
| c) | Define Stream ciphers? | [2] |
| d) | Discuss about Blowfish. | [3] |
| e) | What is Biometric authentication? | [2] |
| f) | Discuss various Digital signatures. | [3] |
| g) | Give features of Authentication Header. | [2] |
| h) | Explain IP Security. | [3] |
| i) | How to manage the password? | [2] |
| j) | Discuss cross site scripting vulnerability. | [3] |

PART - B

(50 Marks)

- | | | |
|-----------|---|-------|
| 2.a) | Discuss in detail about various types of Security attacks with neat diagrams. | |
| b) | Give a model for Network Security with neat diagram. | [5+5] |
| OR | | |
| 3.a) | What is symmetric key cryptography? Discuss its advantages and limitations. | |
| b) | Explain various substitution techniques with suitable examples. | [5+5] |
| 4.a) | Explain DES algorithm with suitable examples. Discuss its advantages and limitations. | |
| b) | What is Elliptic Curve Cryptography (ECC)? Discuss ECC algorithm with neat diagram. | [5+5] |
| OR | | |
| 5.a) | Explain RSA algorithm with suitable examples. | |
| b) | Write a short note on RC4. | [5+5] |
| 6.a) | Write a short note on knapsack algorithm. | |
| b) | Give various Hash Functions. Discuss secure hash algorithm with suitable examples. | [5+5] |
| OR | | |
| 7.a) | Discuss HMAC and CMAC. | |
| b) | Write a short note on Kerberos. | [5+5] |

- 8.a) Write a short note on Pretty Good Privacy.
b) Give IP Security architecture with neat diagram.

[5+5]

OR

- 9.a) Write a short note on S/MIME.
b) Discuss in detail encapsulating security payload.

[5+5]

- 10.a) What is Intrusion? Discuss Intrusion detection system with neat diagram.
b) Discuss the need of Secure Socket Layer.

[5+5]

OR

- 11.a) Write a short note on firewall design principles and types of firewalls.
b) Discuss in detail about secure electronic transaction.

[5+5]

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R13

Code No: 126DV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

FOUNDATION ENGINEERING

(Common to CE, CEE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Define area ratio. [2]
- b) Define outside clearance. [3]
- c) What are types of slope failures? [2]
- d) Write the Taylors stability number. [3]
- e) What is earth pressure at rest? [2]
- f) What are the different types of retaining walls? [3]
- g) Define the net and gross bearing capacity. [2]
- h) Define dynamic formulae of Danish. [3]
- i) List the different shapes of well foundations. [2]
- j) What is the permissible flit of well foundations? [3]

PART - B

(50 Marks)

- 2.a) Explain briefly Standard penetration test.
- b) Determine the passive pressure by Rankine's theory per unit run for a retaining wall 4m high, with $i=15^\circ$, $\Phi'=30^\circ$ and $\gamma=19 \text{ kN/m}^3$. The back face of the wall is smooth and vertical. [5+5]

OR

- 3.a) Explain the need for soil exploration and Illustrate methods of it.
- b) The field 'N' value in a deposit of fully submerged fine sand was 50 at a depth of 8 m. The average saturated unit weight of soil is 19 kN/m^3 . Calculate the corrected 'N' value. [5+5]

- 4.a) Explain Bishop's simplified method. Derive an expression for the factor of safety.
- b) Determine the safe height of a slope which is to be constructed at an angle of 30° with the horizontal. The required factor of safety with respect to both cohesion and angle of internal friction is 1.5, and the soil has the following properties: $C=10 \text{ kN/m}^2$, $\Phi=22.5^\circ$ and density = 20 kN/m^3 . Taylor's stability numbers for mobilized friction angles of 22.5° and 15° are, respectively, 0.016 and 0.046. [5+5]

OR

- 5.a) How a slope is analysed using Swedish circle method? Derive an expression for the factor of safety.
- b) Determine the factor of safety with respect to cohesion, if an embankment of 20 m height and having a slope of 45° is subjected to sudden drawdown. $C=20 \text{ kN/m}^2$, $\Phi=30^\circ$, $\gamma_{\text{sat}}=18 \text{ kN/m}^3$ (Take Taylor's stability number = 0.08). [5+5]

- 6.a) Describe the Culmann's graphical method of determining the active earth pressure in cohesion less soils.
- b) A retaining wall with smooth vertical back is 8m high and retains a two layer sand back fill. The top layer is 3m high having $\phi=30^\circ$ and $\gamma=20 \text{ kN/m}^3$. The bottom layer is 5m having $\phi=35^\circ$ and $\gamma=22 \text{ kN/m}^3$. Determine the total active earth pressure and point of its application. [5+5]

OR

- 7.a) State the assumptions in Rankine's theory. Derive an expression for Active and Passive pressure.
- b) Discuss the principles of the design of retaining walls. [5+5]
- 8.a) Differentiate between general shear failure and local shear Failure.
- b) A square footing of 1.8 m size is placed over a sand of bulk density 20 kN/m^3 and saturated density 22 kN/m^3 at a depth of 1.0 m below ground. The angle of internal friction of sand is 30° . The Terzaghi's bearing capacity factors $N_c=30.14$, $N_q=18.4$ and $N_\gamma=15.1$. Determine the ultimate bearing capacity of the soil when there is no effect of water table and when the water table is at base. [5+5]

OR

- 9.a) Discuss the uses of penetration tests for estimation of load-carrying capacity of piles.
- b) A rectangular footing $3\text{m} \times 2\text{m}$ exerts pressure of 100 kN/m^2 on cohesive soils ($E_s=5 \times 10^4 \text{ kN/m}^2$ and $\mu=0.50$). Determine the immediate settlement at the centre; assuring (i) the footing is flexible $I=1.36$ (ii) the footing is rigid. $I=1.06$? [4+6]
- 10.a) Discuss the construction aspects of well foundations.
- b) Discuss the various methods for the design of well foundations. [5+5]
- 11.a) Explain briefly sinking of wells.
- b) Discuss the causes and remedies for tilts and shifts. [5+5]

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R13

Code No: 126EV

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

CLOUD COMPUTING

(Information Technology)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Give a note on Virtual machines. [2]
- b) Write about middleware support for virtualization. [3]
- c) How does cloud computing provide on demand functionality? [2]
- d) List out the characteristics of cloud computing. [3]
- e) Define on demand service. [2]
- f) Describe about the public cloud infrastructure services. [3]
- g) Give a brief note on elasticity. [2]
- h) Write a short note on AWS cloud. [3]
- i) List out the weakness of information cards. [2]
- j) Distinguish direct versus indirect distribution. [3]

PART - B

(50 Marks)

- 2.a) Discuss the distributed system models and enabling technologies. [5+5]
 - b) Explain the system models and distributed cloud computing. [5+5]
- OR**
- 3.a) List and explain the design principles of computer clusters. [5+5]
 - b) Describe the MPP architectures. [5+5]
4. Explain the architecture and design of compute and storage clouds. [10]
- OR**
- 5.a) Why is cloud called as eco system? Justify your answer. [5+5]
 - b) "SOA a step forward cloud computing". Justify. [5+5]
6. What is ANEKA cloud platform? Explain it with a neat sketch. [10]
- OR**
7. Explain the technologies for data security in cloud computing. [10]
 8. Draw a neat sketch and explain automated policy based management. [10]
- OR**
9. Briefly explain the HPC systems and HPC on clouds. [10]
- 10.a) Explain the digital identity and data security. [5+5]
 - b) List and explain the data privacy and security issues. [5+5]
- OR**
11. Explain the common management models. [10]

R13

Code No: 126AJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

STATIC DRIVES

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Draw the circuit symbol of thyristor and mark its terminals. [2]
- b) What is a freewheeling diode? What is its purpose? [3]
- c) What are four quadrants of an electric drive? [2]
- d) Mention the advantages of electric braking over mechanical braking. [3]
- e) What are the applications of four quadrant choppers? [2]
- f) Explain basic principle of a chopper. [3]
- g) What is slip power? [2]
- h) Compare between VSI and CSI. [3]
- i) What is a damper winding? What is its need? [2]
- j) What are the advantages of self controlled synchronous motor drive? [3]

PART - B

(50 Marks)

2. A 220 V, 1500 rpm, 11.6 A D.C separately excited motor is controlled by a 1-phase fully controlled rectifier with an ac source voltage of 230 V, 50 Hz. Enough filter inductance is added to ensure continuous conduction for any torque greater than 25 percent of rated torque, $R_a = 2\Omega$.
 - a) What should be the value of the firing angle to get the rated torque at 1000 rpm? [2]
 - b) Calculate the firing angle for the rated braking torque and -1500 rpm. [3]
 - c) Calculate the motor speed at the rated torque and $\alpha = 160^\circ$ for the regenerative braking in the second quadrant. [10]

OR

- 3.a) Compare between semi converters and fully controlled converters. [2]
- b) What are the advantages of three-phase converters over single phase converters? [3]
- c) Write the speed and torque expressions for single phase fully controlled converter fed separately excited DC motor. [3+3+4]

4. With a neat block diagram, explain the closed loop control of DC motor drive. [10]

OR

- 5.a) What is regenerative braking? Explain regenerating braking of DC motors. Also mention its advantages. [5]
- b) What are dual converters? Discuss its principle. Also mention their applications. [5+5]

- 6.a) What are different choppers? Explain the time ratio control of choppers.
b) A 220V, 24A, 100 rpm separately excited DC motor has an armature resistance of 2Ω . Motor is controlled by a chopper with frequency of 500 Hz and source voltage of 230V. Calculate the duty ratio for 1.2 times rated torque and 500 rpm. [5+5]

7. **OR**
A 230V, 960 rpm, 200A separately excited DC motor has an armature resistance of 0.02Ω . The motor is fed from a chopper which provides both motoring and braking operations. The source has a voltage of 230V. Assume continuous conduction.
a) Calculate the duty ratio of the chopper for motoring operation at rated torque and 350 rpm
b) Calculate the duty ratio of the chopper for braking operation at rated torque and 350 rpm.
c) If the maximum duty ratio of the chopper is limited to 0.95 and maximum permissible motor current is twice the rated, calculate maximum permissible motor speed obtainable without field weakening and power fed to the source.
d) If the motor field is also controlled in (c), calculate field current as a function of its rated value for a speed of 1200 rpm [2+2+3+3]

8. What are ac voltage controllers? Explain the speed control of three-phase induction motors using ac voltage controllers. Also draw the speed-torque characteristics. [10]

- OR**
9.a) What is a PWM inverter? Explain its operation.
b) With a neat block diagram, explain the closed loop control of PWM inverter fed three-phase induction motor drive. [5+5]

- 10.a) Compare between self control and separate control of synchronous motor drive.
b) With a neat block diagram, explain the separate control of synchronous motor drive. Also mention its applications. [5+5]

- OR**
11.a) List and explain various applications of load commutated CSI fed synchronous motor.
b) Explain the operation of Load commutated CSI fed Synchronous Motor. [5+5]

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R09

Code No: 56019

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

DESIGN OF MACHINE MEMBERS-II

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

PSG design data book is permitted in to the exam hall

Assume suitable data if necessary:

- 1.a) Explain wedge film and squeeze film journal bearings.
- b) Design a journal bearing for a centrifugal pump running at 1440 r.p.m. The diameter of the journal is 100 mm and load on each bearing is 20 kN. The factor ZN/p may be taken as 28 for centrifugal pump bearings. The bearing is running at 75°C temperature and the atmosphere temperature is 30°C . The energy dissipation coefficient is $875 \text{ W/m}^2/^{\circ}\text{C}$. Take diametral clearance as 0.1 mm. [5+10]
- 2.a) Name the material that is used for make ball bearings.
- b) A rolling contact bearing is subjected to the following work cycle: (i) Radial load of 6000 N at 150 r.p.m. for 25% of the time; (ii) Radial load of 7500 N at 600 r.p.m. for 20% of the time; and (iii) Radial load of 2000 N at 300 r.p.m. for 55% of the time. The inner ring rotates and loads are steady. Select a bearing for an expected average life of 2500 hours. [3+12]
- 3.a) Explain the various types of crankshafts.
- b) Determine the dimensions of an I-section connecting rod for a petrol engine from the following data: Diameter of the piston = 110 mm; Mass of the reciprocating parts = 2 kg; Length of the connecting rod from centre to centre = 325 mm; Stroke length = 150 mm; R.P.M. = 1500 with possible over speed of 2500; Compression ratio = 4: 1; Maximum explosion pressure = 2.5 N/mm^2 . [3+12]
- 4.a) What are the different materials in Rope drives?
- b) A roller chain drive is used between a driver shaft running at 1440 rpm and a driven shaft running approximately at 720rpm. The power transmitted is 15 KW. The drive is to be used for 2 shifts/day with 8hours/shift. The center distance is approximately 1000mm and the chain tension can be adjusted by moving the motor in the rails. Design the drive. [4+11]
- 5.a) List the advantages and disadvantages of Spur Gears.
- b) Design a spur gear drive required to transmit 45 KW at pinion speed of 800 rpm. The velocity ratio is 3.5:1. The teeth are 200 full depth involute with 18 teeth on the pinion. Both the pinion and gear are made of steel with a maximum safe static stress of 180 N/mm^2 . Assume medium shock condition. [3+12]

- 6.a) Explain "crossed helical gear drive is not used for power transmission".
- b) Design a cast iron bevel gear drive for a pillar drilling machine to transmit 1875 Watts at 800rpm to a spindle at 400 rpm. The gear is to work for 40 hrs/week for 3 years. Pressure angle is 20 degree. [5+10]
- 7.a) What is power screw? State its applications and advantages.
- b) The lead screw of a lathe has square threads of 50mm outside diameter and 8mm pitch. The screw must exert an axial pressure of 2500N in order to drive the tool carriage. The thrust is carried on collar 110mm outside diameter and 55mm inside diameter and lead. Screw rotates at 30rpm. Find: i) Power required to drive the screw, ii) efficiency of the lead screw. Assume $\mu = 0.15$ for screw and $\mu = 0.12$ for collar. [3+12]
- 8.a) List the materials used for the manufacture of worm and worm wheel.
- b) Design the worm gear drive and determine the power loss by heat generation of Hardened steel worm rotates at 1440 rpm and transmits 12 KW to a phosphor bronze gear with gear ratio of 16. [3+12]

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R09

Code No: 56012

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

MICROPROCESSORS AND MICROCONTROLLERS

(Common to ECM, ECE, EEE, EIE)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Show the memory organization of 8085 and interfacing of the 1KB memory with 8085.
- b) What are the two functional units of 8086? Explain the architecture of 8086 with neat block diagram.
- c) What is the purpose of READY and TRAP pins in 8085 Microprocessor? [5+7+3]
- 2.a) Discuss I/O map of 8086 with neat diagram.
- b) Interface D to A converter DAC 0800 with 8086 running at 8 MHz and write an ALP to generate a triangular wave of 1 kHz frequency with V_{max} of 5V.
- c) Discuss any three assembler directives with examples. [5+4+6]
- 3.a) Write an 8086 assembler program to decide the parity of a given number. The given number might be a multi-byte with a maximum length of 8 bytes.
- b) If the execution unit generates an effective address of 43A2H and the DS register contains 4000H. What will be the physical address generated by the BIU? What is the maximum size of the data segment?
- c) Write a program with a flowchart to multiply two 16-bit numbers. [5+2+8]
- 4.a) Discuss the interrupt priority schemes used in 8259.
- b) Discuss the priorities of DMA request inputs of 8257.
- c) An 8086 system has a DMA controller 8257 interfaced such that address of its mode set register is F8H and address of its DMA address register of channel 0 is F0H. Write an Assembly language program to read 2K bytes of data from location 5000H: 2000H in the system memory to a peripheral on channel of the DMA controller. Disable all other channels, program TC stop, no auto load is required, normal priority. [5+3+7]
- 5.a) Explain the mode instruction control word format of 8251.
- b) Draw and discuss internal architecture of USART 8251.
- c) How data is transmitted in asynchronous serial communication? [5+6+4]
- 6.a) Discuss the internal memory organization of 8051 microcontroller.
- b) What is the importance of special function registers (SPF) in 8051?
- c) Explain the arithmetic and logic instruction of 8051 microcontroller with example. [5+5+5]
- 7.a) Explain how serial communication is performed in 8051 microcontroller.
- b) Explain how interrupts are handled in 8051.
- c) Explain the modes of operation of Timer unit in 8051 Microcontroller. [5+5+5]

- 8.a) Can we have an AVR chip with no EEPROM?
b) What is the address range for the internal RAM?
c) What is the maximum number of bytes that the AVR can have for the data memory?

[5+5+6]

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R09

Code No: 56030

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

NETWORK SECURITY

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) List and explain categories of Security Services and Mechanisms.
b) What are the different RFCs and Internet standards related to security? Logically organize them and explain their contribution. [8+7]
- 2.a) Illustrate the functions of Message Authentication.
b) What basic arithmetical and logical functions are used in SHA? [10+5]
- 3.a) Mention three variations of digital signatures and briefly state the purpose of each.
b) Explain different crypto algorithms where public key cryptosystems are used. [10+5]
- 4.a) List and explain the types of messages in PGP and their purposes.
b) Explain the web of trust made from certificates in PGP and in S/MIME. [8+7]
- 5.a) What are the roles of the Oakley key determination protocol and ISAKMP in IPsec?
b) Explain IP security architecture and also explain basic combinations of security associations with a neat diagram. [7+8]
- 6.a) Draw and explain the SSL message formats.
b) In SSL and TLS, why is there a separate change cipher spec protocol, rather than including a change_cipher_spec message in the handshake protocol? [7+8]
- 7.a) Compare and contrast SNMPv1 and SNMPv3.
b) List and briefly explain three classes of intruders. [7+8]
- 8.a) Where would you place a web server in an organization assuming that you can use a network firewall and why?
b) What does it mean to say that a system is "trusted"? Do you agree that "only a trusted system can break your security"? Why or why not. [7+8]

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Code No: 126EH

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

AUTOMOBILE ENGINEERING

(Common to ME, MCT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Define Chassis. [2]
- b) What is MPFI system? [3]
- c) Define thermostat. [2]
- d) What are the requirements of a good spark plug? [3]
- e) Define contact brakera. [2]
- f) What is the function of a propeller shaft? [3]
- g) What is King pin inclination? [2]
- h) What is meant by Toe-in and Toe-out? [3]
- i) Name the different alternative fuels. [2]
- j) Define octane and Cetane numbers. [3]

PART - B

(50 Marks)

- 2.a) Classify the different types of carburettors. [5]
 - b) Show and explain with reason the mixture requirement for idling, cruising and high power range at various throttle openings. [5]
- OR
- 3.a) What is the function of Fuel-injection holder? [5]
 - b) Explain the different types of nozzles with neat sketches. [5]
- 4.a) What are the advantages of liquid-cooling systems. [5]
 - b) Explain the working of thermo-syphon cooling system. [5]
- OR
- 5.a) What are the factors that affect spark-advance. [5]
 - b) Briefly explain the working of the battery-ignition system with the help of a circuit diagram. [5]
- 6.a) What is the principle of differential? [5]
 - b) Differentiate between Torque tube and Hotch-kiss drive. [5]
- OR
- 7.a) What are the function of a shock absorber? [5]
 - b) Explain the construction and working of telescopic type of shock absorber with the help of a neat diagram. [5]

26 26 26 26 26 26 26
8.a) Write a short note on Tandem master cylinder. 26
b) Explain hydraulic brake system with neat sketch. [5+5]

OR

9.a) Write a short note on Ackerman steering gear mechanism.
b) Explain the construction and working of Davis steering gear mechanism. [5+5]

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10.a) What are the advantages of C.N.G and L.P.G?
b) Explain the working of a catalytic converter. [5+5]

OR

11.a) How hydrogen fuel is used as an alternate fuel?
b) What are the advantages and disadvantages of Bio-diesel? [5+5]

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R13

Code No: 126EQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

OBJECT ORIENTED ANALYSIS AND DESIGN

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) List the principles of modeling in UML. [2]
- b) What are the four aims of modeling? [3]
- c) Write the steps for modeling distribution. [2]
- d) Define responsibility with an example. [3]
- e) Write the uses of interaction diagram. [2]
- f) What is activity diagram? [3]
- g) Give the graphical representation of messages, links and sequencing of interactions. [2]
- h) Give an example Collaboration diagram and explain. [3]
- i) Define pattern with an example. [2]
- j) What is an use case diagram? [3]

PART - B

(50 Marks)

- 2.a) Explain about the common division mechanisms of UML in detail.
- b) Discuss the Software development life cycle with a neat diagram. [5+5]

OR

- 3.a) Illustrate the conceptual model of UML in detail.
- b) What is UML? Elaborate the object oriented design with an example. [5+5]

4. Enumerate the steps to model the client-server systems. [10]

OR

- 5.a) Draw and explain the class diagram for an ATM bank system.
- b) Explain about links and associations in detail. [5+5]

6. Draw the complete use case diagram for the library system and explain the relationships and responsibilities of various actors. [10]

OR

7. Draw the usecase diagram and the activity diagram for an online airline reservation system. Summarize the purpose of each usecase, actor, and its importance. Briefly explain various activity states and action states in the activity diagram. [10]

8. Define an event and a signal. Explain briefly about the common modeling techniques of events and signals. [10]

OR

9. Explain the forward engineering tool and reverse engineering tool for a sample code with respect to the state chart diagram. [10]

10. What are the various object participating in the library information system? Explain the object diagram that is associated with various interactions with a neat diagram. [10]

OR

11. Explain "Issuing of a book" operation using collaboration diagram. [10]

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R13

Code No: 126AK

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

MICROPROCESSORS AND INTERFACING DEVICES

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What are the different registers of 8086? [2]
- b) What are memory addresses? [3]
- c) What are instruction formats? [2]
- d) Define addressing mode. [3]
- e) What are static memories? [2]
- f) Define vector interrupt table. [3]
- g) Give bit format used for sensing asynchronous serial data. [2]
- h) Mention 8251A USART pin descriptions. [3]
- i) What is the importance of jump instructions in assembly language programming for 8051? [2]
- j) What is the significance of program status word (PSW) register of 8051 microcontroller. [3]

PART - B

(50 Marks)
(25 Marks)

- 2.a) Explain 8086 architecture with neat diagram.
 - b) How do you generate delays in software? What are the limitations of this method of generating delays? How will you synchronize one such delay with an external process? [7+3]
- OR**
- 3.a) Draw and discuss a typical minimum mode 8086 system. [6+4]
 - b) Explain Interrupt structure of 8086.
- 4.a) Write an ALP to convert a four digit hexadecimal number to decimal number. [5+5]
 - b) Write an ALP to find out transpose of 3×3 matrix.
- OR**
5. Use the 8086 string instructions to write a program which scans a string of 80 characters looking for carriage return (0DH). If a carriage return is found, put the length of the string upto the carriage return in AL. If no carriage return is found, put 50H (80 decimal) in AL. [10]

- 6.a) Explain internal architecture of 8255. [4+6]
b) Explain keyboard interfacing with 8086.

OR

- 7.a) Explain stepper motor interfacing with 8086 generating clockwise and anticlockwise rotations. [6+4]
b) Describe the functional diagram of 8259.

- 8.a) Explain serial communication standards. [5+5]
b) Explain the IEEE-488 with the schematic diagram.

OR

- 9.a) Describe serial data transfer schemes.
b) Draw a diagram showing the list format used for asynchronous serial data. Label the start, stop and parity bits. Number the data bits to show the order of transmission. [7+3]

- 10.a) Explain the I/O ports structure of 8051. [4+6]
b) Discuss the different SFRs of 8051.

OR

- 11.a) Explain different addressing modes of 8051. [6+4]
b) Explain the each bit of TCON and PCON of 8051.

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R13

Code No: 126AA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

ENVIRONMENTAL ENGINEERING

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Write notes on types of demands. [2]
- b) What is protected water supply? [3]
- c) Explain the theory of chlorination. [2]
- d) Explain coagulation-flocculation. [3]
- e) What are the shapes and materials used in design of sewers? [2]
- f) Write about flushing tanks. [3]
- g) Sketch the layout and general outline of various units in a wastewater treatment plant. [2]
- h) Explain the need of design of screens. [3]
- i) Write a note on self-purification of rivers. [2]
- j) What is sewage farming? [3]

PART - B

(50 Marks)

- 2.a) Explain in detail about the population forecasting methods.
- b) The population for a certain town is given below. Find out the population in the year 2020 and 2030 by geometrical increase method. [5+5]

Year	1970	1980	1990	2000	2010
Population	75,000	1,10,000	1,50,000	2,00,000	2,42,000

OR

- 3.a) What are the fluctuations in water demand?
- b) What are the sources of water?
- c) Write in detail about the water quality standards. [3+3+4]
- 4.a) Discuss in detail about the principal and working of a rapid sand filter.
- b) Explain the troubles in operation of filters.
- c) What is the role of a service reservoir in water distribution system? [3+3+4]

OR

- 5.a) With the help of sketches, discuss about the layouts of distribution systems.
- b) Compare the working of slow and rapid gravity filters. [5+5]

- 6.a) Explain the conservancy and water carriage system. [5+5]
b) Write briefly about sewer appurtenances.

OR

- 7.a) Explain sanitary fittings, one pipe, and two pipe systems of plumbing. [5+5]
b) Compare the differences between centrifugal and displacement type pumps.

- 8.a) Explain the principle and working of trickling filter. [5+5]
b) Write a detailed note on modified ASP.

OR

- 9.a) Define Aeration. [5+5]
b) Explain the principal and working of the Activated Sludge Processes.

- 10.a) Explain the design and working principles of septic tank. [5+5]
b) Describe in brief about oxidation ditches.

OR

- 11.a) Enumerate working principles and design of soak pits. [5+5]
b) Explain ultimate disposal of wastewater.

Code No: 56020

R09

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

HEAT TRANSFER
(Common to AME, ME)

Time: 3 hours

Max. Marks: 75

Answer any five questions

All questions carry equal marks

- 1.a) State the pertinent assumption made, derive the general heat conduction equation for spherical coordinate system.
- b) Briefly narrate the conduction, convection and radiation. Also state the laws of governing the three modes of heat transfer. [8+7]
- 2.a) A cylinder 5 cm diameter and 50 cm long, is provided with 14 longitudinal straight fins of 1 mm thick and 2.5 mm height. Calculate the heat loss from the cylinder per second if the surface temperature of the cylinder is 200°C . Take $h=25 \text{ W/m}^2\text{K}$, $k=80 \text{ W/mK}$ and ambient temperature $=45^{\circ}\text{C}$.
- b) Of the three geometries viz., slab, cylinder and sphere, explain as to which geometry does not have any critical thickness of insulation? Also, derive the expression for critical radius of cylinder. [8+7]
- 3.a) A steel ball of 5 cm diameter initially at a uniform temperature of 450°C is suddenly placed in an environment at 100°C . Heat transfer coefficient between the steel ball and the fluid is $10 \text{ W/m}^2\text{K}$. For steel $c_p=0.46 \text{ kJ/kgK}$, density $=7800 \text{ kg/m}^3$, $k=35 \text{ W/mK}$. Calculate the time required to reach a temperature of 150°C . Also find the rate of cooling after 1 hr.
- b) What do you understand by 'lumped system analysis'? Derive an expression for temperature distribution in a body during Newtonian heating or cooling. [8+7]
- 4.a) Glycerin at 10°C flows over a flat plate 6 m long, maintained at 30°C with a velocity of 1.5 m/s. Determine the total drag force and the heat transfer rate over the entire plate per unit width.
- b) Name four important dimensionless numbers in forced convection heat transfer. What are their physical significances? [8+7]
- 5.a) A hot square plate $50 \text{ cm} \times 50 \text{ cm}$, at 100°C is exposed to atmosphere air at 20°C . Find the heat loss from both the surfaces of the plate:
i) if the plate is kept vertical
ii) if the plate is kept horizontal
- b) Using dimensional analysis, derive an expression for the Nusselt number in terms of Prandtl number and Grashoff number for free convection heat transfer system. [8+7]

6.a) Saturated steam at a temperature of 65°C condenses on vertical surface at 55°C . Determine the thickness of the condensate film at locations 0.2 m and 1.0 m from top. Also calculate the condensate flow rate at these locations.

b) Draw the boiling curve for pool boiling of water and explain flow regimes. [8+7]

7.a) A double pipe heat exchanger is made up of inner tube 37.5 mm ID, 44.8 mm OD, and outer tube 72.7 mm OD and 5.1 mm wall steel pipe, has an effective heating surface of 2.4 m^2 based on outer surface of inner pipe. It is proposed to use this exchanger to preheat benzene from an initial temperature of 20°C by means of hot water which will enter the exchanger at 88°C . Benzene will flow through the annulus at the rate of $5,500\text{ kg/hr}$ and the hot water will flow through the tube at 6250 kg/hr . Determine the outlet temperature of benzene if counter flow heat exchanger is used. Take thermal conductivity for steel is 45.72 W/mK .

b) Derive the LMTD expression for counter flow heat exchanger. [8+7]

8.a) Define the Planck's law of monochromatic black body radiation and prove that the total emissive power of a black body is given by $E_b = 5.669 \times 10^{-8} T^4$.

b) A hemispherical furnace of radius 1.0 m has a roof temperature 527°C and emissivity is 0.8. The flat circular floor of the furnace has a temperature of 327°C and emissivity is 0.5. Calculate the net radiation heat exchange between the roof and floor. [8+7]

R09

Code No: 56011

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

COMPUTER METHODS IN POWER SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

-
- 1.a) How are buses classified in load flow studies? Explain them.
b) Derive static load flow equations from fundamentals. [7+8]
- 2.a) Obtain the performance equation for the partial network with an added branch.
b) Derive element-pair admittance matrix from node-pair impedance matrix. [7+8]
3. Explain how the voltage controls at the terminal of a reactive power source taken in Gauss Seidal method using Y_{Bus} . [15]
4. Compare the relative merits and demerits of the various techniques used for solving the static load flow equation. [15]
- 5.a) Draw the flowchart for short circuit studies and explain.
b) State the advantages of per unit representation in power system analysis. [9+6]
- 6.a) Derive the equations for the total fault current in terms of symmetrical components and phase quantities for the following faults at bus P
i) Three phase (not grounded)
ii) Line-to-line
b) Explain the analysis of a short circuit on a loaded three phase synchronous machine. [9+6]
- 7.a) Differentiate between steady state stability and transient stability of power system. Discuss the factors that effect:
i) Steady state stability
ii) Transient stability of the system
b) A 50 Hz, 4 pole turbogenerator rated 100 MVA, 11 kV has an inertia constant of 8 MJ/MVA.
i) Find the stored energy in the rotor at synchronous speed.
ii) If the mechanical input is suddenly raised to 80 MW for an electrical load of 50 MW, find rotor acceleration, neglecting mechanical and electrical losses.
iii) If the acceleration calculated in part (ii) is maintained for 10 cycles, find the change in torque angle and rotor speed in revolutions per minute at the end of this period. [8+7]
- 8.a) Explain the point-by-point solution of Swing equation.
b) The generalized circuit constants of a power system are
 $A=D=0.98 \angle 0.2^\circ$
 $B=83 \angle 78^\circ \text{ ohms}$
 $C=0.00048 \angle 90^\circ \text{ mho}$
Find the steady state stability of the system if $|V_S|$ and $|V_R|$ are held constant at 220kV. [8+7]

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R13

Code No: 126EC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

DISASTER MANAGEMENT

(Common to AE, AG, AME, ECE, EEE, EIE, ETM, IT, ME, MIE, MSNT, PTM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Define meteorological disaster? [2]
- b) List the causes of environmental pollution. [3]
- c) Give examples of natural disasters. [2]
- d) What is a nuclear hazard? [3]
- e) Mention different types of cyclonic disasters. [2]
- f) List worst draught affected states of India. [3]
- g) What are the different types of volcano? [2]
- h) List a few soil erosional causes and management. [3]
- i) Differentiate rescue and preparedness. [2]
- j) Discuss the different stages of relief process. [3]

PART - B

(50 Marks)

2. Explain in detail the aspects of environmental stress and management of the environment. [10]
- OR**
3. Explain different types of meteorological disaster. [10]
4. How the manmade hazards controlled and regulated? Discuss. [10]
- OR**
5. Discuss about Endogenous Hazards and Exogenous Hazards. [10]
6. Explain Human adjustment, perception and mitigation of earthquake in India. [10]
- OR**
7. Define Volcanism and discuss the causes and effects. [10]
8. Mention causes of draught and the mitigation measures. [10]
- OR**
9. Discuss different frequent and infrequent events in detail. [10]
10. Discuss the different aspects of disaster mitigation through advanced technology. [10]
- OR**
11. Explain with a suitable case study the mitigation and management of cyclonic disaster. [10]

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R13

Code No: 126AD

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

GROUND IMPROVEMENT TECHNIQUES

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) List out various application of mechanical method. [2]
- b) Explain in-situ tests to characterize problematic soils. [3]
- c) Write the applications of dynamic tamping? [2]
- d) List out the functions of compaction pile. [3]
- e) What do you mean by electro-osmosis? [2]
- f) Define on geo-drains. [3]
- g) What do you understand by ground freezing? [2]
- h) Enumerate various objectives of grouting. [3]
- i) What are the objectives of in-situ reinforcement? [2]
- j) Explain step by step process in rock bolting. [3]

PART - B

(50 Marks)

2. Explain, briefly the need and objectives of ground modification. [10]
- OR**
3. Explain the various electrical methods of densifying cohesive soils. [10]
4. How can you densify cohesion less soil with the help of vibro compaction technique? [10]
- OR**
5. Describe the method of densification by Blasting? Explain its effectiveness. [10]
6. Explain the properties of a material to be selected as a Geo-synthetics? [10]
- OR**
7. What is vertical drain explain the design of vertical drain? [10]
- 8.a) Differentiate between the compaction grouting and displacement grouting. [5+5]
- b) Write a short notes on shotcreting.
- OR**
9. Explain briefly different types of grouting techniques. [10]
10. Explain the steps involved in designing reinforced earth wall. [10]
- OR**
- 11.a) Write a short notes on grid reinforced soil. [5+5]
- b) Discuss about reinforcement with strip.

R13

Code No: 126AP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

DISTRIBUTED SYSTEMS

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Give an example of a URL. [2]
- b) Distinguish between buffering and caching. [3]
- c) Write a short notes on elections. [2]
- d) Write a formula for the maximum throughput of a mutual exclusion system in terms of the synchronization delay. [3]
- e) Why is there no explicit data typing in CORBA CDR? [2]
- f) Is it conceivably useful for a port to have several receivers? [3]
- g) How does AFS deal with the risk that callback messages may be lost? [2]
- h) Which other name server addresses do DNS name servers hold by default, and why? [3]
- i) List the types of entry in a recovery file. [2]
- j) Give a brief note on nested transactions. [3]

PART - B

(50 Marks)

- 2.a) Illustrate the client server architecture of one or more major internet applications.
- b) List the types of local resource that are vulnerable to an attack by an untrusted program that is downloaded from a remote site and run in a local computer. [5+5]

OR

- 3.a) Describe possible occurrence of each of the main types of security threat that might occur in the internet.
- b) Give a brief note on web servers and web browsers. [5+5]

4. Explain how to adapt the causally ordered multicast protocol to handle overlapping groups. [10]

OR

- 5.a) Write a short note on clocks, events and process states.
- b) Give an example execution of the ring based algorithm to show that processes are not necessarily granted entry to the critical section in happened before order. [5+5]

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6. Briefly explain the external data representation and marshalling. [10]

OR

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7. Describe a scenario in which a client could receive a reply from an earlier call. [10]

8. Explain why iterative navigation is necessary in a name service and indicate how, if at all, these may be overcome. [10]

OR

9. Discuss the whether message passing or DSM is preferable for fault tolerant applications. [10]

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10.a) Give a brief note on distributed deadlocks.
b) Discuss the optimistic concurrency control. [5+5]

OR

11. Describe how a non-recoverable situation could arise if write locks are released after the last operation of transaction but before its commitment. [10]

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R13

Code No: 126EA

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

INTELLECTUAL PROPERTY RIGHTS

(Common to AE, AG, CHEM, ECE, EEE, EIE, IT, ME, MMT, MIE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is intellectual property? [2]
- b) Explain the need of copyrights. [3]
- c) What is the purpose of trademark? [2]
- d) Explain the types of marks. [3]
- e) What is the duration of copyright? [2]
- f) What are the basic requirements to be eligible for patent protection? [3]
- g) What is unfair competition? [2]
- h) "Copyright rights often intersect with trade secrets". Explain. [3]
- i) How are domain names function like a trademark? [2]
- j) Explain business method patents. [3]

PART - B

(50 Marks)

- 2.a) Explain the trademarks and service marks.
 - b) What is trade secret? Discuss about the protection of trade secrets. [5+5]
- OR**
- 3.a) Give a note on various international organizations and agencies that promote the use and protection of Intellectual property.
 - b) Explain the necessity of Intellectual property rights. [5+5]
- 4.a) In detail, explain the different categories of marks.
 - b) Explain the acquisition of trademark rights. [5+5]
- OR**
- 5.a) Explain the selection and evaluation process of a mark.
 - b) Explain trademark registration process. [5+5]
- 6.a) Explain the salient features of copyright law.
 - b) Discuss about the copy right ownership issues. [5+5]
- OR**
7. Explain fully the procedure for grant and sealing of patent under the Patent Law. [10]

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- 8.a) Explain the law governing trade secrets.
b) Discuss the liability for misappropriation of trade secrets.

[5+5]

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- 9.a) Discuss about trade secrets litigation.
b) Explain false advertising.

[5+5]

10. What are the new developments with respect to the following intellectual property rights?

- a) Trademark law
b) Patent law.

[5+5]

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- 11.a) Explain international developments in trade secrets law.
b) Write short notes on intellectual property auditing.

[5+5]

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R13

Code No: 126EB

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

HUMAN VALUES AND PROFESSIONAL ETHICS

(Common to AE, AG, AME, ECE, EEE, EIE, IT, ME, MCT, MIE, PTM)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is the meaning of prosperity? [2]
- b) What are the basic guidelines for Value Education? [3]
- c) What is Prosperity? [2]
- d) 'Human being is co-existence of the Self and the Body'—Comment on this statement. [3]
- e) What is Samman? [2]
- f) Difference between intention and competence. [3]
- g) Define Harmony in Existence. [2]
- h) Explain about Pranic order. [3]
- i) Define Professional Ethics. [2]
- j) Discuss Ethical Human Conduct. [3]

PART - B

(50 Marks)

- 2.a) Define self exploration. What is the content of self – exploration?
 - b) What is the program to fulfill the basic human aspirations? Explain. [5+5]
- OR**
- 3.a) What is your present vision of a happy and prosperous life?
 - b) Write a short note on the need for value education in today's scenario. [5+5]
- 4.a) Distinguish between Sukh and Suvidha in detail taking needs of yourself as an example.
 - b) How do sensations and pre-conditionings influence our imagination? Give two examples of each. [5+5]
- OR**
- 5.a) Discuss Understanding Harmony in Myself
 - b) "I am the seer, doer and enjoyer. The body is my instrument" – Explain. [5+5]
- 6.a) What do you understand by trust? Differentiate between intention and competence with examples.
 - b) Discuss how to develop Harmony in the Family? [5+5]

OR

7.a) How do we come to differentiate between human beings on the basis of body? Explain. What are its consequences?

b) In our behaviour, we generally observe our intention and others' lack of competence. Does it lead to mutual happiness? What is the alternative? Explain with the help of an example. [5+5]

8.a) How will you show interconnectedness and mutual fulfillment in four order of nature with examples.

b) How the activity in human order is different with that of animal and plant order? [5+5]

OR

9.a) What do you understand by 'activity'? Write down the activity of the four orders in nature.

b) Existence is co-existence of mutually interacting units in all-pervasive space. Explain. [5+5]

10.a) What do you understand by holistic technology? Briefly explain.

b) What are the implications of value based living at all four levels of living? Explain. [5+5]

OR

11.a) Critically examine the issues in professional ethics in the current scenario. List any five unethical practices in profession today and the methods being tried to curb them.

b) What do you understand by competence in professional ethics? Give two examples of its implications in industry. [5+5]

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R09

Code No: 56013

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

RENEWABLE ENERGY SOURCES
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

1. List the solar radiation measuring instruments. Explain the working principle of a sunshine recorder. [15]
2. What are the limitations of energy extraction in a flat plate collector? How is solar concentration undertaken? Explain. [15]
- 3.a) What is meant by solar heating? Explain its operating principle with sketch.
b) How is solar drying undertaken? [8+7]
4. What control systems are employed in a wind turbine? Explain its working. [15]
5. Explain with a sketch the working of a fixed drum biogas plant. [15]
6. Explain the resources of geothermal energy in India. [15]
7. Explain the working principle of any wave energy conversion device. [15]
8. Discuss the Principle of Direct Energy Conversion and what are its limitations? [15]

---ooOoo---

R09

Code No: 56022

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

AUTOMOBILE ENGINEERING
(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) What are the different types of chassis? Explain in detail.
b) Explain the working of a turbocharger.
c) With the help of line diagram explain cartridge type oil filter. [5+4+6]
- 2.a) With the help of neat sketch explain port injection in SI engines
b) Explain the effect of nozzle size and spray formation on efficiency of the engine. [6+9]
- 3.a) With the help of neat sketch explain bellow type thermostat.
b) With the help of neat sketch explain magneto coil ignition system. [7+8]
- 4.a) With the help of neat sketch explain multipoint fuel injection for SI engines.
b) Explain pollution control techniques in IC Engines. [10+5]
- 5.a) With the help of line diagram explain current voltage regulator.
b) With the help of line diagram explain working of oil pressure gauge. [8+7]
- 6.a) With the help of neat sketch explain working of single plate clutch.
b) Explain working of constant mesh gear box. [7+8]
- 7.a) With the help of neat sketch explain working of telescopic hydraulic shock absorber.
b) Explain working of mechanical brake system. [8+7]
- 8.a) Explain Ackerman Steering mechanism.
b) Explain rack and pinion steering mechanism. [8+7]

---ooOoo---

R09

Code No: 56032

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

WEB TECHNOLOGIES
(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Give brief description about cascading style sheets.
b) With the help of syntax and example write the important tags supported by HTML. [7+8]
- 2.a) List the advantages and disadvantages of using java scripts.
b) In what way a dynamic html differs from static html. Explain.
c) Write a java script to validate the user name and password. [5+5+5]
- 3.a) What is a well formed XML document and list out the basic rules to write XML document?
b) What is XSLT and make a comparison between XML DTD and XML schema or XSD. [7+8]
- 4.a) What are java beans? List the advantages of using it.
b) What are the constrained properties of java beans and explain about interface of beans. [7+8]
- 5.a) Explain the steps for path setting and running a program in tomcat with an example.
b) What is session and what are the security issues involved in web servers. [8+7]
- 6.a) What is JSP and explain life-cycle methods for JSP.
b) What are the basic differences between the JSP custom tags and java beans? Explain. [7+8]
- 7.a) How will you use the JSP language elements for accessing Beans in your JSP pages?
b) List out the features of Implicit JSP Objects and its advantages. [8+7]
- 8.a) Explain about JDBC and its applications.
b) Write a short note on different types of drivers and its usage. [7+8]

---ooOoo---

R13

Code No: 126EW

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

DATA WAREHOUSING AND DATA MINING

(Information Technology)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is the significance of Data warehousing? [2]
- b) How Data mining is different from KDD? [3]
- c) What is Star Schema? [2]
- d) Describe the features of OLTP systems. [3]
- e) What is Data Transformation? [2]
- f) What are the principles of APRIORI algorithms? [3]
- g) Describe Decision Tree construction. [2]
- h) How to measure best split of any classification? [3]
- i) What are the key issues in Hierarchical clustering? [2]
- j) Give an overview of Outlier Detection. [3]

PART - B

(50 Marks)

2. Explain in detail about 3 tier Data Warehousing architecture with a neat sketch. [10]
- OR
3. Describe the architecture of OLTP with its operation. [10]
- 4.a) What are the challenges of KDD?
- b) Discuss about Dimensionality Reduction. [5+5]
- OR
5. Explain the basic Data mining tasks with example. [10]
6. Briefly discuss about different partition algorithms with an example. [10]
- OR
- 7.a) What is Frequent Item Set Generation? Explain.
- b) Explain the compact representation of Frequent Item Data Set. [5+5]
- 8.a) What are the general approaches to consider for solving classification problem?
- b) Describe about different classification techniques. [5+5]
- OR
- 9.a) How to evaluate any classifier model, which was build for classification.
- b) Discuss about KNN classification. [5+5]
10. Explain with example how clustering can be with large databases. [10]
- OR
11. Discuss about K-means clustering algorithm step by step with an example. [10]

R13

Code No: 126ED

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

DESIGN OF MACHINE MEMBERS - II

(Common to AME, ME)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Assume suitable data, if necessary.

PART - A

(25 Marks)

- 1.a) State any two advantages and disadvantages of deep groove ball bearings. [2]
- b) What is meant by conformability and embeddability with respect to sliding contact bearing materials? [3]
- c) Name the materials used for piston rings. [2]
- d) What is the difference between the centre and overhung crank shafts? [3]
- e) What are the desirable properties of the belt materials? [2]
- f) How will you designate roller chain? [3]
- g) Why is the pinion weaker than the gear made of same material? [2]
- h) What kind of contact occurs between worm and worm wheel? How does it differ from other types of gears? [3]
- i) What are the applications of square threads? [2]
- j) What is self-locking of power screw? State the applications where self-locking is essential. [3]

PART - B

(50 Marks)

2. The following data is given for a 360° hydrodynamic bearing:
- | | | | | |
|------------------|-----------|---|------------------------|------------|
| Journal diameter | = 100 mm | ; | Bearing length | = 100 mm |
| Radial load | = 50 kN | ; | Journal speed | = 1440 rpm |
| Radial clearance | = 0.12 mm | ; | Viscosity of lubricant | = 16 cp |
- Calculate (a) minimum film thickness (b) coefficient of friction and (c) power lost in friction. [10]

OR

- 3.a) Define dynamic load carrying capacity of rolling contact bearing.
- b) The radial load acting on a ball bearing is 2500 N for the first 5 revolutions and reduces to 1500 N for the next ten revolutions. The load variation then repeats itself. The expected life of the bearing is 20 million revolutions. Determine the dynamic load carrying capacity of the bearing. [5+5]

4. Determine the dimensions of small and big end bearings of the connecting rod for a diesel engine with the following data:

Cylinder bore = 100 mm

Maximum gas pressure = 2.45 MPa

(l/d) ratio for piston pin bearing = 1.5

(l/d) ratio for crank pin bearing = 1.4

Allowable bearing pressure for piston pin bearing = 15 MPa

Allowable bearing pressure for crank pin bearing = 10 MPa

[10]

OR

5. The following data is given for the piston of a four-stroke diesel engine:

Cylinder head = 250 mm

Material of piston rings = Grey cast iron

Allowable tensile stress = 100 N/mm²

Allowable radial pressure on cylinder wall = 0.03 MPa

Thickness of piston head = 42 mm

Number of piston rings = 4

Calculate all the dimensions related to piston and piston rings.

[10]

6. It is required to select a flat-belt drive to connect two transmission shafts rotating at 800 and 400 rpm respectively. The centre to centre distance between the shafts is approximately 3 m and the belt drive is open-type. The power transmitted by the belt is 30 kW and the load correction factor is 1.3. The belt should operate at a velocity between 17.8 to 22.9 m/s. The power transmitting capacity of the belt per mm width per ply at 180° arc of contact and at a belt velocity of 5.08 m/s is 0.0147 kW. Select preferred pulley diameters and specify the belt.

[10]

OR

7. A simple roller chain 10B is used to drive the camshaft of an internal combustion engine. Both shafts rotate at 350 rpm and the centre distance between their axes should be approximately 550 mm. The number of teeth on each sprocket wheel is 19. Calculate:

a) The number of chain links and

b) The correct centre distance.

[5+5]

8. It is required to design a pair of spur gears with 20° full-depth involute teeth consisting of a 20-teeth pinion meshing with a 50-teeth gear. The pinion shaft is connected to a 25 kW, 1440 rpm electric motor. The starting torque of the motor can be taken as 150% of the rated torque. The material for the pinion is plain carbon steel Fe410, while the gear is made of grey cast iron FG 200. The factor of safety is 2. Design the gears based on the Lewis equation and using velocity factor to account for the dynamic load.

[10]

OR

9. A pair of helical gears consists of an 18-teeth pinion meshing with a 45-teeth gear. 7.5 kW power at 2000 rpm is supplied to the pinion through its shaft. The normal module is 6 mm, while the normal pressure angle is 20°. The helix angle is 23°. Determine the tangential, radial and axial components of the resultant tooth force between the meshing teeth.

[10]

10. A triple threaded power screw, used in a screw jack, has a nominal diameter of 50 mm and a pitch of 8 mm. The threads are square and the length of nut is 48 mm. The screw jack is used to lift a load of 7.5 kN. The coefficient of friction at the threads is 0.12 and the collar friction is negligible. Calculate:
- The principal shear stress in the screw body
 - The transverse shear stresses in the screw and the nut and
 - The unit bearing pressure
- State whether the screw is self locking. [10]

OR

11. The lead screw of a lathe has single-start ISO metric trapezoidal threads of 52 mm nominal diameter and 8 mm pitch. The screw is required to exert an axial force of 2 kN in order to drive the tool carriage during turning operation. The thrust is carried on a collar of 100 mm outer diameter and 60 mm inner diameter. The values of coefficient of friction at the screw threads and the collar are 0.15 and 0.12 respectively. The lead screw rotates at 30 rpm. Calculate
- The power required to drive the lead screw and
 - The efficiency of the screw. [5+5]

---ooOoo---

R13

Code No: 126AE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

TRANSPORTATION ENGINEERING – I

(Civil Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) List the various types of road patterns. [2]
- b) List the various requirements of Highway Ideal Alignment [3]
- c) List the various assumptions in the analysis of safe Overtaking Sight Distance. [2]
- d) Calculate the extra width required for a two lane highway having a horizontal curve of radius 200m, if the design speed is 80 Km/h. [3]
- e) Draw a neat sketch of Condition and Collision diagram. [2]
- f) Define traffic volume and traffic density and speed. [3]
- g) List the factors to be considered in the design of intersection at grade. [2]
- h) List the various types of on street and off street parking facilities. [3]
- i) List the various tests to be conducted to evaluate the strength properties of soils [2]
- j) Differentiate between Tack Coat and Prime Coat. [3]

PART - B

(50 Marks)

- 2.a) Discuss in detail, the various factors controlling the highway alignment with sketches.
 - b) What is the necessity of Realignment? List and explain the various steps in Realignment. [5+5]
- OR**
- 3.a) What are the various recommendations of Jayakar Committee? How were these implemented?
 - b) What are the various methods of classifying roads? Briefly outline the classification of urban roads. [5+5]

- 4.a) Explain PIEV Theory and the total reaction time of driver.
- b) Calculate the length of transition curve using the following data:
Design speed = 65 Km/h, Radius of circular curve = 220m, pavement width including extra widening = 7.5 m, allowable rate of introduction of super elevation (pavement is rotated about the centerline) is 1 in 150. [5+5]

OR

- 5.a) With the help of a neat sketch, explain the attainment of super elevation in the field.
- b) Calculate the length of vertical valley curve required between -1/30 and +1/25 grades for a speed of 80 Km/h to satisfy comfort and headlight sight distance requirements. [5+5]

26 26 26 26 26 26 26

6.a) Identify and explain by grouping the vehicular characteristics which affect the various elements of road design.

b) Spot speed studies were carried out at a certain stretch of a highway with mixed traffic flow and the consolidated data collected are given below.

Speed range, kmph	No of vehicles observed
0-10	12
10 - 20	18
20 - 30	68
30 - 40	89
40 - 50	204
50 - 60	255
60 - 70	119
70 - 80	43
80 - 90	33
90 - 100	9

[5+5]

OR

7.a) Write a note on various road user characteristics affecting the traffic.

b) Briefly explain the various objectives and methods of O and D studies.

[5+5]

8.a) Briefly explain the various design factors to be considered in the design of rotary.

b) With neat sketches, explain the Different types of traffic Islands and conflicts at Intersections.

[5+5]

OR

9.a) List and explain the various advantages and disadvantages of Rotary.

b) List the various advantages of at grade and Grade separated Intersections.

[5+5]

10.a) List the specifications, materials and construction steps for laying Bituminous concrete.

b) Explain briefly the importance and requirements of Highway Drainage.

[5+5]

OR

11.a) Discuss the desirable properties of Coarse Aggregates. List the various laboratory test conducted to find these properties.

b) Explain how the soils are classified based on HRB soil classification system.

[5+5]

---ooOoo---

R13

Code No: 126AF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech III Year II Semester Examinations, May - 2017

ENVIRONMENTAL STUDIES

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Write about ecosystem value and services. [2]
- b) What is Biomagnification and write its effects on living organisms? [3]
- c) What are the impacts related to Ground water depletion? [2]
- d) Describe the impacts at upstream and down stream due to big dams. [3]
- e) What is Hot spot and mention Indian Hot spots? [2]
- f) List out at least 3 endemic and 3 endangered species of India. [3]
- g) Write about the Earth summit and Kyoto protocol. [2]
- h) What are the control methods of Noise pollution? [3]
- i) What is Ecological foot print? [2]
- j) Describe Life cycle assessment. [3]

PART - B

(50 Marks)

2. Explain 3 biogeochemical cycles with neat sketch. [10]
- OR
3. Describe food chain, food web and ecological pyramids with examples. [10]
4. List and explain the methods of mining and also impacts of mining. [10]
- OR
- 5.a) Describe the sources and causes of soil erosion. [5]
- b) Explain the soil conservation methods. [5]
6. Briefly describe the levels of Biodiversity and uses of Biodiversity. [10]
- OR
7. Write about threats of Biodiversity and explain the conservation methods of Biodiversity. [10]
8. Explain the control methods of particulate and gaseous pollutants. [10]
- OR
9. Describe the primary, secondary and tertiary treatment methods to control water pollution. [10]
- 10.a) Write down salient features of air act and Wild life acts. [5]
- b) Write about Biomedical waste management. [5]
- OR
11. How can we achieve sustainable management? Explain along with a flow chart. [10]

R13

Code No: 126EJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

(Common to CSE, ECE, ETM, MMT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

1. Write short notes on the following:
- a) Nature of Managerial economics [2]
 - b) Giffen's paradox. [3]
 - c) Economies of scale. [2]
 - d) Opportunity cost. [3]
 - e) Markets and Classification. [2]
 - f) Sole proprietorship. [3]
 - g) Capital. [2]
 - h) Working capital cycle and its components. [3]
 - i) Ledger Accounts and classification. [2]
 - j) Trial Balance and its objectives. [3]

PART - B

(50 Marks)

- 2.a) What is Demand? List out the determinants of demand.
b) Define Cross- elasticity of demand and state its importance. How can it be measured? [4+6]

OR

- 3.a) Enumerate the factors involved in demand forecasting.
b) Examine the Trend Projection method of demand forecasting. [5+5]

- 4.a) Explain and illustrate Isoquants and Isocost curves.
b) Discuss the nature and managerial uses of Production function. [5+5]

OR

- 5.a) Describe the Laws of increasing, constant and decreasing returns to scale. Represent them diagrammatically.
b) Illustrate Break-Even analysis with the help of a Break-Even chart. How is it helpful for managerial decisions? [5+5]

- 6.a) Discuss the main features of Monopolistic competition.
b) What are the objectives of Pricing? [5+5]

OR

- 7.a) Evaluate Partnership form of business organization.
b) Describe the changing business environment after liberation. [5+5]

- 8.a) What are the characteristics of Fixed capital and Working capital.
 b) Explain the main sources for mobilizing total capital needed by a business unit. [5+5]
- OR**
- 9.a) Why is Capital Budgeting necessary? Distinguish between non discounting method and discounting method.
 b) Compare Payback Period and Accounting Rate of Return methods of Capital Budgeting. Illustrate with imaginary data. [5+5]
- 10.a) What do you understand by Double Entry system of book-keeping?
 b) Explain the following Ratios.(i) Current Ratio (ii)Quick Ratio and (iii) Debt-Equity Ratio. [5+5]
- OR**
11. From the following Trial Balance and additional information, you are required to prepare a Trading and Profit and loss Account and Balance Sheet. [10]
 Trial Balance as on 31st December, 2005.

Particulars	Dr. Amount (Rs.)	Cr. Amount (Rs.)
Capital		20,000
Sundry Debtors	5,400	
Drawings	1,800	
Machinery	7,000	
Sundry creditors		2,800
Wages	10,000	
Purchases	19,000	
Opening stock	4,000	
Bank balance	3,000	
Carriage charges	300	
Salaries	400	
Rent and Taxes	900	
Sales		29,000
Total	51,800	51,800

Additional Information:

Closing Stock Rs. 1,200

Outstanding rent and taxes Rs. 100

Charge depreciation on machinery at 10%

Wages prepaid Rs. 400

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R09

Code No: 56016

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

INDUSTRIAL MANAGEMENT

(Common to AME, ME, MCT, MIE)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) Explain the concept of planning as an element of Management process? Discuss its role in present day business organizations?
- b) Critically examine Herzberg's two factor theory. Make a comparison between theories of Herzberg and Maslow. Which of these theories do you prefer in Indian context? Give reasons. [7+8]
- 2.a) What do you mean by matrix organization? How does it differ from project organization? Discuss the situations under which matrix organization can be used fruitfully.
- b) Describe various bases for departmentation and suggest a scheme of departmentation for a large marketing company with a field network all over the country. [7+8]
- 3.a) Discuss the main objective which a factory planning engineer should attempt to achieve when designing a plant layout. Explain what is meant by a travel chart and show how such a chart can be of use in determining the best relative location of departments in a factory?
- b) i) A department store manager wishes to make a work sampling study to estimate the percentage time that clerks are busy waiting for customers and percent time that they are idle. The current best guess is that clerks are idle 25 percent of the time. Determine the number of observations required if we wish to be 95 percent confident that the results is within \pm percent, given number of observations at 20% is 2995 and at 30% it is 3750 for the same precision.
- ii) Compare stopwatch study and work sampling in terms of the cost to make studies, representatives of samples taken, field application and comparative accuracy. [7+8]
- 4.a) A manufacturing organization is using a certain raw material, which is consumed in large quantities by various products. The raw material is procured from a local supplier. An extract of the relevant records from the stores indicate the following details about the component.
- | | |
|-------------------------------------|--------------------|
| Mean of weekly demand | : 200 |
| Standard deviation of weekly demand | : 40 |
| Unit cost of the raw material | : Rs 300 |
| Ordering cost | : Rs 460 per order |
| Carrying cost percentage | : 20% per annum |
- The purchase department has indicated that the lead time for procurement of this raw material is two weeks. Past experience with the supplier suggests that there is no uncertainty with respect to the lead-time. The organization has been using EOQ for the purpose of scheduling orders. However, there is general feeling that it is not working satisfactorily. It is not uncommon for the organization to experience stock outs. Work out the parameters of the P and Q systems of the inventory control.

- b) Suppose you develop a classification scheme for selective control of inventories using ABC and VED classification as two dimensions. Relate the discussions pertaining to service level to this two dimensional classification scheme? [8+7]
- 5.a) Discuss briefly the functions of HRM in a big manufacturing organization.
- b) Summarize what you feel are the good and the bad features of employee participative plan. [7+8]
- 6.a) Explain why determining the critical path is important in project management.
- b) A firm is considering the launch of a new product in the national market. The project consists of the ten major activities. The precedence relationship and the estimated duration of each of the activity is given in the table below.

Activity	Predecessor	Duration (weeks)
A	-	8
B	-	3
C	A	6
D	B	4
E	B	5
F	A	4
G	B	6
H	C, D, E	6
I	F, G, H	6

- i) Draw a network of the above project.
- ii) What is the total duration of the project?
- iii) Identify the critical path? Do you have any specific observation to make?
- iv) Suppose the duration of the activity 'f' was wrongly estimated and the revised estimate is 10 weeks. What is the implication of this change? [7+8]
- 7.a) Define product life cycle? Assume that you are a marketing manager for a two wheeler (Hero Honda) bike. What are the marketing strategies you will adopt to increase your sales and profit at each stage?
- b) What are the elements of Corporate Planning Process? Explain. [8+7]
- 8.a) An organization does not know if it needs to go for ISO 9000 certification or ISO 14000 certification. They are also not aware of why they should go for a certification. Prepare a one report to resolve their confusion.
- b) A gearbox manufacturer has 20 gearboxes in stock. Each gearbox has four gears. There are 200 gears already in stock. The gears are made from gear blanks. The stock of gear blanks in the stores is 100. Each gear blank requires 30 kilograms of alloy steel. The stores have 7000 kilograms of alloy steel. Compute the requirement of components for manufacturing 570 gears in the next month. [7+8]

R09

Code No: 56009

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May -2017

ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) State the basic requirement of any measuring instrument. How the various measuring instruments are classified.
- b) Derive the torque equation for moving iron instruments. [8+7]
- 2.a) How to minimize the ratio error and phase angle error in the instrument transformer?
b) Draw and explain the working of three phase electrodynamic type power factor meter. [7+8]
- 3.a) Explain the working of dynamometer type wattmeter.
b) Explain the connection of a single phase wattmeter to measure reactive VA of a three phase system. Draw the phasor diagram. [8+7]
- 4.a) Explain the calibration of single phase energy meter.
b) How creeping adjustment is provided in induction type single phase energy meter. [9+6]
- 5.a) What is standardization of potentiometer? Why it is necessary.
b) Draw and explain the basic slide wire DC potentiometer. [8+7]
- 6.a) Derive the expression for the current through the galvanometer in case of unbalanced Wheatstone bridge.
b) Describe the loss of charge method for high resistance measurement. [8+7]
- 7.a) How Schering bridge is used for the measurement of unknown capacitance. State the advantages.
b) Which measurements can be carried out by Maxwell Bridge? Derive the balance equation and expressions for the unknown components. [8+7]
- 8.a) What is magnetic measurement? What tests are necessary for the magnetic measurement?
b) Explain the construction and use of magnetic potentiometer. [7+8]

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R09

Code No: 56028

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

OBJECT ORIENTED ANALYSIS AND DESIGN

(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

**Answer any five questions
All questions carry equal marks**

- 1.a) Explain about conceptual model of Unified Modeling Language. [8+7]
b) Discuss the architecture of a software-intensive system.
- 2.a) Explain about modeling the distribution of responsibilities in a system.
b) Define a state. Explain different parts of a state.
c) Distinguish between Structured design Vs Object Oriented Design. [5+5+5]
- 3.a) What is meant by activity diagram? Draw the activity diagram for courier system.
b) Define use case diagram? Model a use case diagram for a banking system. State the business rules that you have considered. [7+8]
4. University conducts examinations and prepares a report for the following:
• Print the marks in the register semester wise for each department
• Print the arrear list semester wise.
• Prepares a rank list for each department.
• Prepare the final aggregate mark list for final year students.
Identify the problem statement and design the classes for each sequence. Draw a detailed flow chart using state chart diagrams. Draw all the UML diagrams for designing this system. [15]
- 5.a) Explain in detail about the interaction diagrams and notations.
b) Illustrate with an example state chart diagrams. [8+7]
- 6.a) What is an Event. Explain different types of Events.
b) Make a comparison between Activity and State chart Diagram. [7+8]
- 7.a) Draw a class diagram for banking System.
b) What is the importance of component diagram in UML? Explain in detail. [7+8]
- 8.a) Explain forward and reverse engineering.
b) Design unified library application system by using different behavioral diagrams. [7+8]

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R13

Code No: 126DZ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech III Year II Semester Examinations, May - 2017

STRUCTURAL ANALYSIS - II

(Common to CE, CEE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Define Carryover factor and rotation factor. [2]
b) Calculate the distribution factors at the joints of the frame shown below figure 1. [3]

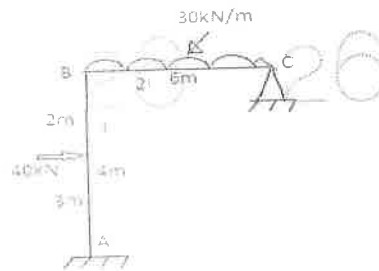


Figure 1

- c) What is the effect of rib shortening in two hinged arch. [2]
d) Draw elastic curve and bending moment diagram for the Frame shown in Figure 2. [3]

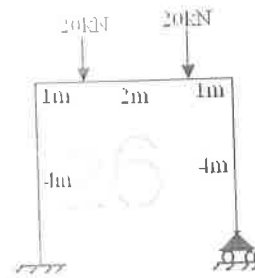


Figure 2

- e) What are the assumptions made in the portal method? [2]
f) Draw the axial force, shear force and bending moment diagrams (qualitatively) of the frame loaded as shown below figure 3. [3]

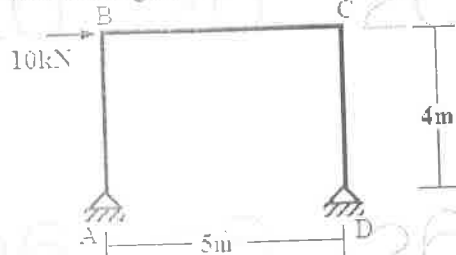


Figure 3

- g) Define Stiffness and Flexibility. [2]
 h) Differentiate static and kinematic indeterminacy of structure, what is the SI and KI of the beam shown below figure 4. [3]

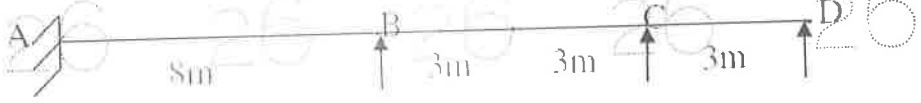


Figure 4

- i) What is the static indeterminacy of truss shown figure 5 below: [2]



Figure 5

- j) Draw ILD (Qualitatively) for the continuous beam shown in Figure 6 below. [3]



Figure 6

PART - B

(50 Marks)

2. Analyze the continuous beam shown in figure 7 by Kani's method and draw BMD. [10]

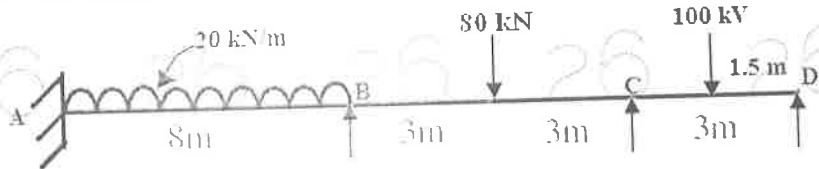


Figure 7

OR

3. Analyze the portal frame shown below figure 8 by moment distribution method. [10]

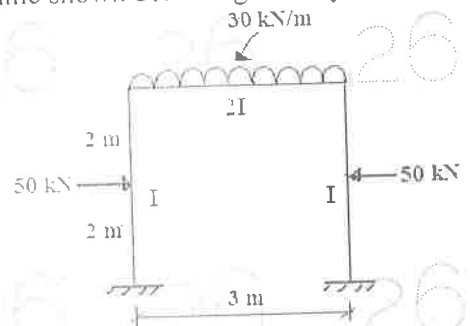


Figure 8

4. A two hinged parabolic arch has a span of 35m and a central rise of 7m. Calculate the bending moment, radial shear and normal thrust at a section distant 10m from the left hinge, due to a single point load of 6kN acting at 12m from the right support. [10]

5. Analyze the portal frame shown in figure 9 by slope-deflection method. [10]

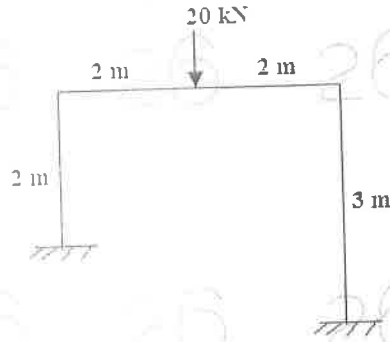


Figure 9

6. Analyze the frame shown in Figure 10 using portal method. [10]

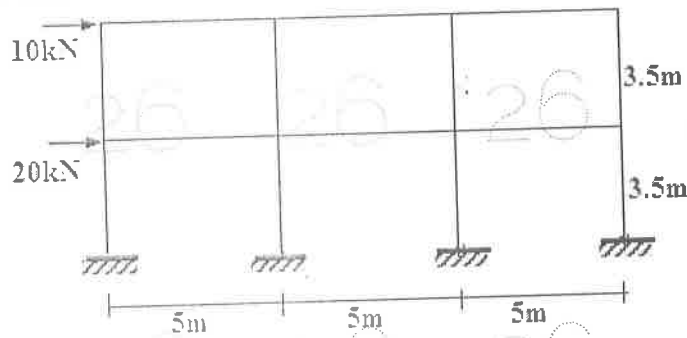


Figure 10

7. Analyze the building frame shown in Figure 11 below by cantilever method. [10]

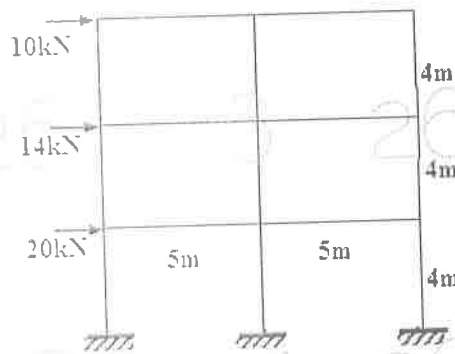


Figure 11

8. Analyze the continuous beam shown in Figure 12 using Flexibility method and draw the Bending moment diagram. [10]

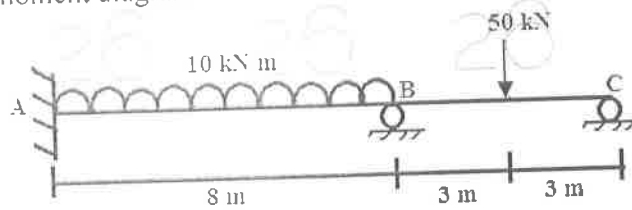


Figure 12

OR

9. Analyze the frame by stiffness matrix method, and draw BMD, take EI as constant. (Figure 13) [10]

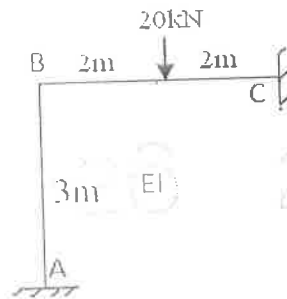


Figure 13

10. Draw the influence line for moment at 'B' M_B for the two span continuous beam ABC simply supported at A and C, AB=4m, BC=5m. EI is constant. [10]

OR

11. A truss is loaded as shown in figure 14. All the members of the truss have same cross sectional area. Find the axial force in the member BC and DE. [10]

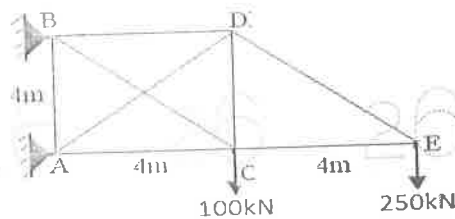


Figure 14

---ooOoo---

Code No: 126AG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

COMPUTER METHODS IN POWER SYSTEMS

(Electrical and Electronics Engineering)

Time: 3 hours.

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Define the bus incidence matrix. [2]
- b) What are the merits for formation Y_{bus} by direct inspection method? [3]
- c) What data is necessary for power flow studies? [2]
- d) What is the need of DC load flows? [3]
- e) What are the various types of series reactors used for reducing the short circuit MVA? [2]
- f) What is the significance fault current calculation and which fault is more severe? [3]
- g) Define the stability limit in power system. [2]
- h) Define the transfer reactance and synchronizing power coefficient. [3]
- i) What are the various applications of equal area criterion? [2]
- j) What are the various methods to improve transient Stability? [3]

PART - B

(50 Marks)

- 2. For the figure 1 shown below, the impedance data is given in table. Determine Y_{Bus} matrix by singular transformation method [10]

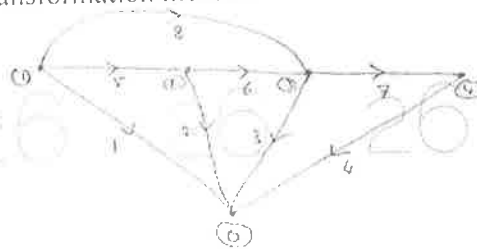


Figure 1

Table

Element	Bus code	Self impedance in p.u
1	0-1	0.1
2	0-2	0.2
3	0-3	0.3
4	0-4	0.35
5	1-2	0.4
6	2-3	0.1
7	3-4	0.2
8	1-3	0.15

OR

3. Find the Z_{Bus} for the power system network shown in below figure 2. All reactance's are in p.u values. [10]

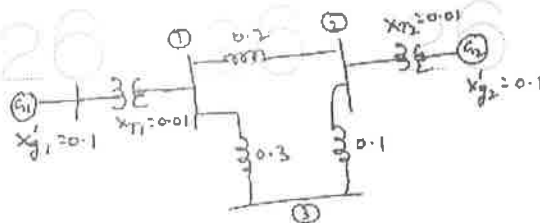


Figure 2

- 4.a) Explain the necessity of load flow solution.
 b) Write an algorithm for Gauss seidal load flow method by considering all types of buses. [3+7]

OR

5. Single line diagram of a simple power system with generators at buses 1 and 3 shown in below figure 3. The necessary data are given in the figure. Line impedances are marked in p.u.on a 100MVA base. Determine the following using Fast-decoupled load flow method at the end of first iteration. [4+3+3]
 a) Voltage at buses 2 and 3 b) Slack bus power c) Direction of line flows.

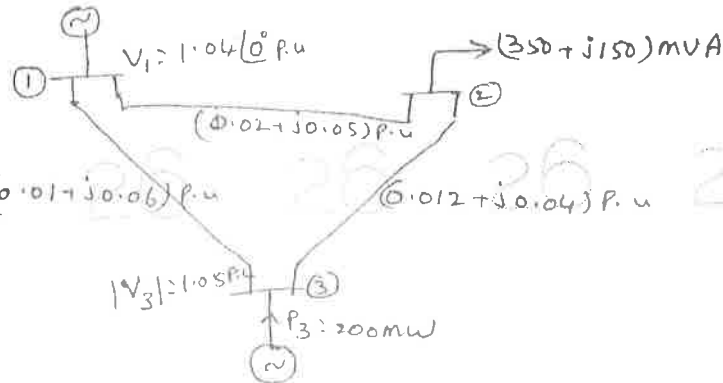


Figure 3

6. A transformer rated at 30 MVA and having a short circuit reactance of 0.02 p.u is connected to the bus bar of a generating station which is supplied through two 12.6 kV feeders each having an impedance of $(2+j4) \Omega$. One of the feeder is connected to the generating station using generator capacity of 40 MVA connected to its bus bars having a short circuit reactance of 0.12 p.u and other feeder to a generator with 30MVA and having a reactance of 0.3 p.u. Find the kVA supplied to the fault in the event of a short circuit occurring between the secondary terminals of the transformer. [10]

OR

- 7.a) What do you understand by sequence network? What is their importance in unsymmetrical fault calculations?
 b) A generator rated 100MVA, 12.6 kV has $X_1 = X_2 = 25\%$ and $X_0 = 10\%$. Its neutral is grounded through a reactance of 0.2Ω . The generator is operating at rated voltage, load is disconnected from the system when single line to ground fault occurs at its terminals. Find the sub-transient current in the fault phase and line to line-fault current. [4+6]

- 8.a) Explain the methods to improve the steady state stability.
 b) Describe the power angle curve.

[5+5]

OR

9. In the double circuit network shown in below figure, a line to ground fault occur on one of the double circuit transmission line at the point shown in the figure 4. Find the transfer reactance and maximum power transfer

- a) Before the fault occurs
 b) While the fault exists and
 c) After the faulty line has been removed.

[3+3+4]

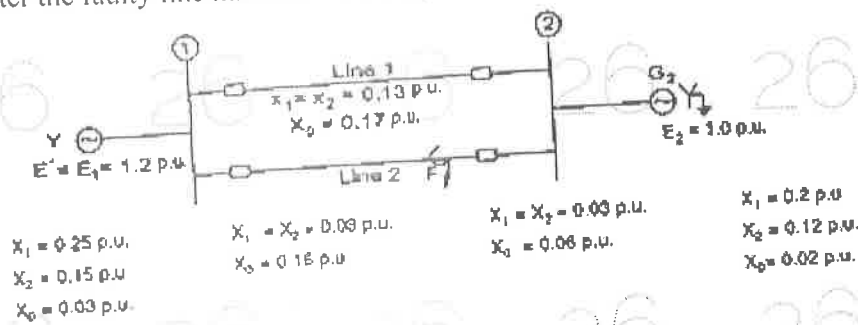


Figure 4

10. Derive an expression for the critical clearing angle for a power system consisting of a single machine supplying to an infinite bus, for a sudden load increment. [10]

OR

11. Explain point-by-point method for solving the swing equation. [10]

---ooOoo---

R13

Code No: 126EE

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

FINITE ELEMENT METHODS

(Common to AE, ME, MSNT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) List the properties of the shape functions. [2]
- b) The nodal displacements of a two noded axial element is $(0, 0.075)$ mm. The length of the element is 0.6 m. Find the stress in the element. Assume the Young's modulus of the element as 200 GPa. [3]
- c) How many DOFs does a two-nodal, planar truss element have in its local coordinate system; and in the global coordinate system? [2]
- d) Represent the Hermite shape functions graphically. [3]
- e) What are the strain displacement relations for axisymmetric element? [2]
- f) Differentiate among the Iso-parametric, Sub-parametric and super-parametric formulation. [3]
- g) What is Thermal conductivity matrix for 2D heat transfer problems? [2]
- h) Derive the governing equation for steady-state, one-dimensional conduction with convection and heat generation? [3]
- i) Define Hamilton principle and compare with the principle of minimum potential energy principle. [2]
- j) Differentiate between the transient dynamic analysis and eigenvalue analysis. [3]

PART - B

(50 Marks)

- 2.a) Derive the stress strain relation for a plane stress condition starting from Hook's law. [5]
- b) A bar of uniform cross section and length L is fixed at one end and is subjected to an axial load of P . If the body is also subjected to a constant body load of F_b throughout its length, develop the total potential energy expression. [5]

OR

3. For the three stepped bar shown in figure 1, determine the displacements at node 2 and 3 and the reactions at the supports. Also find the stresses in each section. [10]

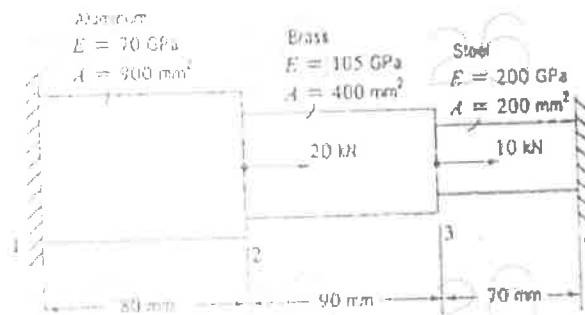


Figure 1

4. The plane truss is loaded with force P as shown in figure 2. Constants E and A for each bar are as shown in the diagram. Determine the nodal displacements, the reaction forces and the stresses in bar elements. [10]

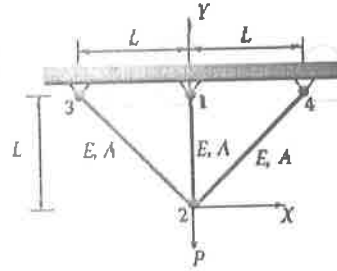


Figure 2

OR

5. A simply supported beam of length of 8 m and uniform cross section of width 300 mm and depth 200 mm is subjected to a uniformly distributed load of 10 kN/m over the entire length. Compute the maximum deflection if the Young's modulus is 200 GPa. Also estimate the slope at the supports. [10]

6. For the four noded quadrilateral element shown in figure 3, find the nodal load vector if p_0 is 2MPa. Also find the determinant of the Jacobian for one point gauss quadrature. [10]

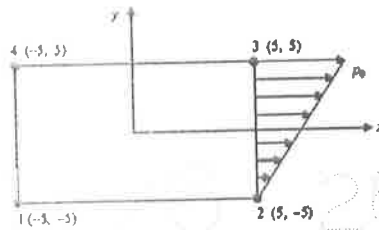


Figure 3

OR

7. An axisymmetric triangular element is described by the following details. Determine the element stresses at the centroid for the Young's Modulus 80 GPa and Poisson's Ratio 0.25. [10]

	Node 1	Node 2	Node 3
Radial Coordinate from the axis (r)	5 mm	1 mm	3 mm
Axial coordinate (z)	5 mm	5 mm	2mm
Deformation in radial direction (u)	0.02 mm	0.06 mm	0.01 mm
Deformation in axial direction (u)	-0.04 mm	0	0.02 mm

8. Estimate the temperature profile in a pin fin of diameter 25 mm, whose length is 500mm. The thermal conductivity of the fin material is 50 W/m K and heat transfer coefficient over the surface of the fin is 40 W/m² K at 30°C. The tip is insulated and the base is exposed to a temperature of 150 °C. Evaluate the temperatures at points separated by 100 mm each. [10]

OR

9. For a two dimensional heat transfer in a square slab shown in figure 4, each element equilibrium equation are given by the same expression. All the edges are maintained at zero degree temperature. What is the final form of equations after assembly and incorporating the boundary conditions? [10]

$$\begin{bmatrix} 25 & -1 & 21 \\ -1 & 18 & -7 \\ 21 & -7 & 41 \end{bmatrix} \begin{Bmatrix} T_i \\ T_j \\ T_k \end{Bmatrix} = \begin{Bmatrix} 300 \\ 500 \\ 800 \end{Bmatrix}$$

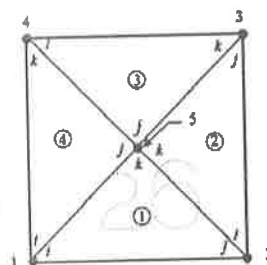


Figure 4

10. Consider a uniform cross section bar of length L made up of a material whose Young's modulus and density are given by E and ρ . Estimate the natural frequencies of axial vibration of the bar using both consistent and lumped mass matrices. [10]

OR

- 11.a) What are the convergence and compatibility requirements? Discuss in detail.
 b) Derive the shape functions for a four noded tetrahedral element using natural coordinate system. [5+5]

---ooOoo---

R13

Code No: 126EP

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

WEB TECHNOLOGIES

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is PHP? What are the common uses of PHP? [2]
- b) How to declare a string in PHP? List various string functions in PHP. [3]
- c) State rules to define tags in XML. [2]
- d) What is DTD? Distinguish between internal DTD and external DTD. [3]
- e) How is a Servlet different from an Applet? [2]
- f) Write about servlet API. [3]
- g) Provide an example for JSP expression. [2]
- h) How are cookies used for session tracking in JSP? [3]
- i) What is the scope of variables in JavaScript? [2]
- j) What is an 'event'? How are events handled in JavaScript? [3]

PART - B

(50 Marks)

- 2.a) What are various operators supported by PHP.
- b) Explain about the control structures in PHP with illustrations. [3+7]

OR

- 3.a) How to list the directories in PHP?
- b) Explain about various file operations on text files in PHP. [3+7]

- 4.a) What is DOM?
- b) Compare and contrast DOM parser with SAX Parser. [2+8]

OR

- 5.a) List any *two* XML tags with their attributes and values.
- b) Collect the student's details such as, register number, name, subject and marks using forms and generate a DTD for this XML document. Display the collected information in the descending order of marks. Write XML source code for the above. [4+6]

- 6.a) What is JDBC? What are various drivers of JDBC?
- b) Explain about the database connectivity using JDBC. [4+6]

OR

- 7.a) Develop a servlet that handles an HTTP POST request.
- b) Discuss about Session tracking in Servlets with a suitable example. [5+5]

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- 8.a) Describe the anatomy of a JSP page.
b) Write a in brief about JSP Declarations. [7+3]

OR

9. Explain in detail of how to use Java Beans in JSP pages with suitable example. [10]

26 26 26 26 26 26 26

- 10.a) What is the need of scripting languages in Web Technologies?
b) Write a program in JavaScript to convert temperature from Celsius to Fahrenheit and vice versa or Height from centimeters to inches and vice-versa. [2+8]

OR

11. Write about the following with reference to Java Script with an example:

a) Functions

b) Form Validation

26 26 26 26 26 26 26 [5+5]

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R09

Code No: 56029

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

VLSI DESIGN

(Computer Science and Engineering)

Max. Marks: 75

Time: 3 hours

Answer any five questions
All questions carry equal marks

- 1.a) Mention the advantages of CMOS over bipolar technologies.
b) Why ion-implantation is preferred over diffusion for impurity doping? Explain briefly ion-implantation technique. [8+7]
- 2.a) Clearly explain about different regions of operation in MOS transistors with the relevant equation.
b) Explain about the BiCMOS inverters with neat diagrams. [8+7]
- 3.a) Mention the scaling factors for device parameters. Explain the limitations of scaling.
b) What is stick diagram? Explain about different symbols used for components in stick diagram. [8+7]
- 4.a) What is meant by switch logic? Explain switch logic with one suitable example.
b) What are the various ways to reduce the delay time of a MOS inverter? [8+7]
- 5.a) Draw the Barrel shifter architecture and explain its operation.
b) Explain how a comparator for two n-bit numbers is carried out. [8+7]
- 6.a) Explain the 3 transistor DRAM cell operation.
b) Explain how the given Boolean function can be implemented using ROM. [8+7]
- 7.a) What is CPLD? Draw its basic structure and give its applications.
b) Implement full subtractor by using PLA. [8+7]
- 8.a) What is the need of Test and Testability in VLSI system design?
b) Explain briefly about system level test techniques. [8+7]

---ooOoo---

R09

Code No: 56010

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

POWER SEMICONDUCTOR DRIVES

(Electrical and Electronics Engineering)

Max. Marks: 75

Time: 3 hours

Answer any five questions
All questions carry equal marks

-
- 1.a) Explain the working of single phase semi converter fed dc separately excited motor with relevant equations and waveforms. Also draw speed torque curves as function of firing angle.
- b) Draw the speed torque characteristics of DC series motor fed from a single phase semi converter as a function of firing angle for continuous current conduction. [10+5]
- 2.a) Draw the average voltage curve as function of firing angle for a three phase fully controlled converter for continuous conduction.
- b) A 3-phase full wave converter drive is feeding power to a 220V, 20 HP, 1500 rpm separately excited dc shunt motor having an efficiency of 80%. The field is controlled by a 3-phase full converter. The ac input to the converters is 400 V, 3-phase, 50 Hz, Y connected supply system. The resistances of the armature and the field windings are 0.25 Ω and 250 Ω respective. The motor constant is 0.8 V/A rad/s. The viscous friction and no-load losses are negligible. The armature and the field currents are assumed to be continuous and ripple free.
- i) If the delay angle of the field converter is 30° and the developed torque is 120 Nm at 1500 rpm, determine the delay angle of the armature converter.
- ii) With the speed at 1800 rpm, the developed torque at 120 Nm, the delay angle of the armature converter at 45° determine the delay angle of the field converter. [5+10]
- 3.a) Draw and explain the block diagram of closed speed control of DC motor (below and above rated speed).
- b) Explain the four quadrant operation of DC motor using Dual converter in circulating current mode of operation. [7+8]
- 4.a) A 220 V, 1500 rpm, 200 A separately excited dc shunt motor has an armature resistance of 0.05 Ω and is fed from a 220 V supply. The motor is chopper controlled which provides both motoring and braking operation. Assuming continuous conduction.
- i) Determine the duty ratio of the chopper for operation at rated torque and at 500 rpm
- ii) Calculate the duty ratio of the chopper for braking operation at rated torque and at 500 rpm
- b) Discuss the operation of a two quadrant chopper fed dc separately motor with necessary waveforms. [10+5]
- 5.a) Draw and explain the speed torque characteristics of induction with variable stator voltage control.
- b) Discuss the operation of a three phase induction motor fed from AC voltage controller with necessary waveforms. [5+10]

6. A 3-phase, 400 V, 50 Hz, 6 pole, 860 rpm induction motor has the following parameters
Stator resistance $R_1=2.0 \Omega$, rotor resistance referred to stator $R_2=4.0\Omega$, stator reactance $X_1=5.0\Omega$, rotor reactance referred to stator $X_2=5.0\Omega$. The motor is controlled by voltage source inverter at constant V/f ratio. Inverter allows variation from 10 Hz to 50 Hz.
Calculate (a) The speed for frequency of 20 Hz and at 70% full load torque (b) The frequency for a speed of 500 rpm and at full load torque (c) The torque for a frequency of 30 Hz and a speed of 400 rpm. [15]

- 7.a) Explain the operation of Cyclo-converter fed Synchronous motor with suitable diagrams.
b) With suitable diagrams explain the working of a CSI fed Synchronous motor drive. [8+7]
- 8.a) Explain the speed control operation of 3 phase Induction motor using static rotor resistance method. Also derive the necessary equations.
b) With the help of neat diagram and necessary equations explain the working of static Scherbius drive. [5+10]

---ooOoo---

R09

Code No: 56017

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

FINITE ELEMENT METHODS

(Common to AE, ME)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) What are the merits and the demerits of Finite Element Methods?
b) If a displacement field is described as follows:
 $u = (-x^2 + 2y^2 + 6xy)10^{-4}$ and $v = (3x + 6y - y^2)10^{-4}$,
Determine the strain components ϵ_{xx} , ϵ_{yy} , and ϵ_{xy} at the point $x = 1$; $y = 0$. [15]

- 2.a) Write the comparison of Finite element method with other methods
b) (i) Evaluate ξ , N_1 and N_2 at the point P, (ii) If $q_1 = 0.003$ in and $q_2 = 0.005$ in, Determine the value of the displacement q at point P (figure 1). [7+8]

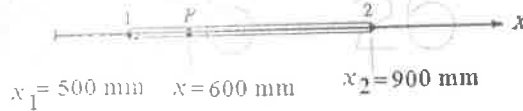


Figure 1

3. For the three bar truss shown in figure 2, determine the displacement of node 1 and the stress in element 3. [15]

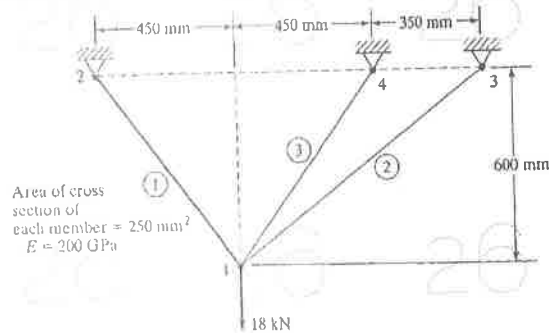


Figure 2

- 4.a) Derive the hermite shape functions of beam element.
b) For the beam and loading shown in figure 3, determine the slopes at 2 and 3 and vertical deflection at midpoint of distributed load. [7+8]

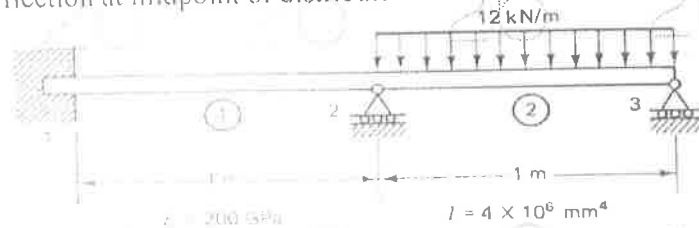


Figure 3

5. Explain in detail how the element stiffness matrix and the load vector are evaluated in isoparametric formulation. [15]
6. Determine the Jacobian and the transformation equations for the following figure 4. [15]

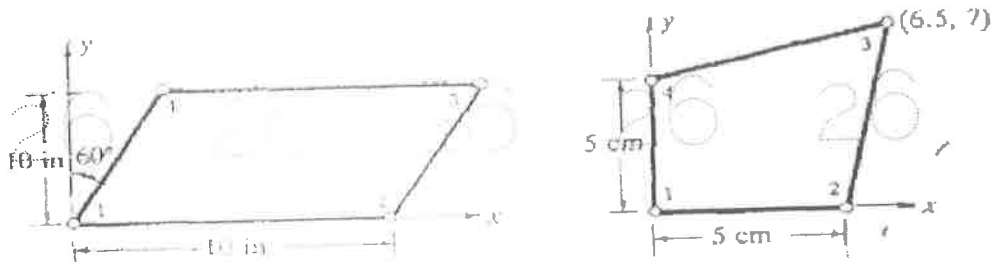


Figure 4

7. The coordinates of the nodes of a triangular element are 1(-1, 4), 2(5, -2) and 3(3, -6) of thickness 0.2cm. The convection takes place over all surfaces with a heat transfer coefficient of $150 \text{ W/m}^2\text{K}$ and $T = 30^\circ\text{C}$. Determine the conductivity matrix and load vector if the internal heat generation is 200 W/cm^3 . Assume thermal conductivity of the element is 100 W/m-K . [15]
- 8.a) Discuss in detail Lagrange interpolation functions. [5]
- b) Explain how boundary conditions are handled in FEM. [5]
- c) Derive the characteristic matrix for two dimensional fin. [5+5]

---ooOoo---

R13

Code No: 126DY

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

STEEL STRUCTURES DESIGN AND DRAWING

(Common to CE, CEE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) What is structural steel? Write its use in engineering structures. [2]
- b) What is lap joint? What are the different types of lap joints? [3]
- c) Define slenderness ratio? [2]
- d) What is strut? What are the common sections used as strut? [3]
- e) What are the different types of beam sections? [2]
- f) What do you understand laterally restrained beams? Explain with diagram? [3]
- g) What is roof truss? What are the different parts of roof truss? [2]
- h) What are purlins? Write its use. [3]
- i) What is the maximum spacing of vertical stiffener in plate girder? [2]
- j) What is the permissible stress in bending for rolled steel I-section beam? [3]

PART-B

(50 Marks)

2. Calculate the strength of a 20mm diameter bolt of grade 4.6 for the following cases. The main plates to be jointed are 12mm thick.
 - a) Lap joint
 - b) Single cover butt joint, cover plate being 10mm thick. [5+5]
3. **OR**
A 120mm diameter and 6mm thick pipe is fillet welded to a 14mm plate. It is subjected to a vertical factored load of 4.5kN at 1m from the welded end and a factored twisting moment of 1.8kN-m. Design the joint assuming shop welding and steel grade Fe410. [10]
4. Design a double angle discontinuous strut to carry a factored load of 135kN. The length of strut is 3m between intersections. The two angles are placed back to back (with long legs are connected) and are tack bolted. Use steel grade Fe410.
 - a) Angles are placed on opposite side of 12mm gusset plate.
 - b) Angles are placed on same side of 12mm gusset plate. [5+5]

OR

5. Design a single angle strut for a roof truss carrying a compressive load of 80kN. The length of strut between centre to centre is 354cm. Also design the welded connection. [10]

6. Design a laterally supported beam of effective span 6m for the following data.

Grade of steel = Fe410

Maximum bending moment $M = 150\text{kNm}$

Maximum shear force $V = 210\text{kN}$

Check for deflection is not required.

[10]

OR

7. A simply supported steel of 5m effective span is laterally supported throughout. It carries a total uniformly distributed load of 50kN (including self-weight). Design an appropriate section using steel grade Fe410. [10]

8. Design a stiffened seated connection for an ISMB 350 @ 514N/m with the column section ISHB 300 @ 576.8N/m. the beam transmits an end reaction of 320kN due to factored loads. The steel is of grade of Fe410. [10]

OR

9. Design a seat connection for the factored beam end reaction of 110kN. The beam section is ISMB 250 @ 365.9 N/m connected to the flange of column section ISHB200 @ 365.9 N/m using bolted connection. Steel is of Fe410 and bolts are of grade 4.6. [10]

10. A column section ISHB 250 @ 500.3 N/m carries an axial load of 600kN. Design the column splices. [10]

OR

11. Design a welded simply supported plate girder for a span of 30m. The girder is loaded with uniformly distributed load of the intensity 35kN/m due to dead and live loads. [10]

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R13

Code No: 126AH

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

ELECTRICAL AND ELECTRONICS INSTRUMENTATION

(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) List different types of static errors of a measuring instrument [2]
- b) Calculate the value of the multiplier resistance on the 100 V range of a DC voltmeter that uses a 100 mA meter movement with an internal resistance of 100Ω . [3]
- c) What do you mean by standardization? [2]
- d) What is a potentiometer and mention applications of it? [3]
- e) Justify: "Dynamometer type instrument is used as a wattmeter" [2]
- f) Why lag adjustment is provided in induction type single phase energy meter? [3]
- g) Define dissipation factor? [2]
- h) Explain the concept of the loss of charge method used in measuring insulation resistance. [3]
- i) Explain how to use a bonded resistance wire strain gauge. [2]
- j) List the factors to be considered while selecting a transducer for a given application. [3]

PART - B

(50 Marks)

- 2.a) Develop the torque equation for a MI instrument and mention few applications.
- b) A moving coil instrument having internal resistance of 50Ω indicates full scale deflection with a current of 10 mA. How can it be made to work as (i) a voltmeter to read 100 V on full scale (ii) an ammeter of 1 A, on full scale? [5+5]

OR

- 3.a) Derive the equations for force and torque of an electrostatic instruments.
- b) Why is damping required for an electromechanical measuring instrument? Explain various damping systems. [5+5]
- 4.a) Draw the circuit diagram of a basic slide wire D.C. potentiometer. Explain its working?
- b) A slide wire potentiometer of 150 cm in length has a resistance of 150Ω , the working battery has an e.m.f of 4.2 volts and negligible internal resistance. The galvanometer resistance is 20Ω . The standard cell has an e.m.f of 1.018V and internal resistance of 1.5Ω . The rheostat in the circuit is adjusted so that the standard cell is in balance with the slide wire contact set at 101.8cm. Find the resistance of the rheostat? [5+5]

OR

5.a) Derive expression for actual transformation ratio, ratio error and phasor angle error of a P.T.

b) A current transformer with bar primary has 300 turns in its secondary winding. The resistance and reactance of the secondary circuit are 1.5Ω and 1.0Ω respectively, including the transformer winding. With 5A flowing in the secondary winding, the magnetizing mmf is 100AT and the core loss is 1.2 W. Determine the ratio and phase angle errors [5+5]

6.a) With the help of neat sketch explain the construction of a single phase induction type energy meter and its principle of operation.

b) An energy meter is designed to make 100 revolutions of the disc for one unit of energy. Calculate the number of revolutions made by it when connected to a load carrying 20A at 230volts at 0.8 pf for an hour. If it actually makes 360 revolutions, find the percentage error. [5+5]

OR

7.a) With help of neat sketch, explain about a reactive power measurement using single wattmeter. Also draw the phasor diagram.

b) If the current in a pressure coil of a wattmeter lags 20° behind the voltage, and the instrument is accurate when $\cos \phi = 1$, find the percentage error when $\cos \phi = 0.8$. [5+5]

8.a) Derive the balance conditions of Wheatstone's bridge. State its limitations.

b) Explain the substitute method of measurement of medium resistance. [5+5]

OR

9.a) Draw the Maxwell's Inductance Bridge circuit. Also draw its phasor diagram and derive expression for unknown inductance.

b) How Schering Bridge is used for the measurement of unknown capacitor. [5+5]

10.a) What is Piezo electric transducer? Explain its operation.

b) Explain the working of i) Photovoltaic cells ii) Thermistors. [5+5]

OR

11.a) With a block diagram, explain the working of CRO.

b) Explain the method of measuring displacement using LVDT with a suitable diagram and State the advantages and disadvantages of LVDT. [5+5]

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R13

Code No: 126EF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech-III Year II Semester Examinations, May - 2017

HEAT TRANSFER

(Common to AME, ME, MSNT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B. Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Give an example of combined conduction and convection mode of heat transfer. [2]
- b) What is thermal contact resistance? [3]
- c) What is the concept of critical thickness? [2]
- d) What is infinite plate in analysis of transient heat conduction? [3]
- e) How Reynolds number is a criterion for dynamic similarity. [2]
- f) What is Buckingham's Π theorem? [3]
- g) What is radiation shape factor? [2]
- h) What are the various radiation properties? [3]
- i) Describe the selection criteria of heat exchanger. [2]
- j) What is the range of effectiveness of a heat exchanger? [3]

PART - B

(50 Marks)

- 2.a) Describe the boundary conditions for steady, unsteady and periodic heat transfer.
- b) An aluminum pan whose thermal conductivity is $237 \text{ W/(m}^0\text{C)}$ has a flat bottom with diameter 100mm and thickness 6 mm. Heat transferred steadily to boiling water in the pan through its bottom at a rate of 500W. If the inner surface of the bottom of the pan is at 150^0C , determine the temperature of the outer surface of the bottom of the pan. [5+5]

OR

3. Derive the heat conduction equation in a cylindrical coordinate system. [10]
4. Describe the temperature distribution along the length of a fin for four various boundary conditions at tip. [10]

OR

5. A very long, 10 mm diameter copper rod ($k= 370 \text{ W/ (m K)}$) is exposed to an environment at 20^0 C . the base temperature of the rod is maintained at 120^0C . The heat transfer coefficient between the rod and the surrounding air is $10 \text{ W/m}^2 \text{ K}$.
 - a) Determine the heat transfer rate for finite lengths, 0.02, 0.04, 0.08, 0.2, 0.4, 0.8, 1 and 10 meters assuming heat loss at the end, and
 - b) Compare the result with that of an infinitely long fin whose tip temperature equals the environment temperature of 20^0C . [5+5]

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6. Estimate the heat loss from a vertical wall exposed to nitrogen at one atmospheric pressure and 4°C . The wall is 0.2m high and 2.5 m wide, and is maintained at 56°C . The average Nusselt number Nu_H over the height of the plate for natural convection is given by $\text{Nu}_H = 0.13(\text{Gr}_H \text{Pr})^{1/3}$. The properties for nitrogen at a mean film temperature of $(56 + 4)/2 = 30^{\circ}\text{C}$ are given as $\rho = 1.142 \text{ kg/m}^3$, $k = 0.026 \text{ W/m K}$, $\nu = 15.63 \times 10^{-6} \text{ m}^2/\text{s}$, $\text{Pr} = 0.713$. [10]

OR

7. Derive the expression for boundary layer thickness for free convection heat transfer on a vertical flat plate. [10]

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8. Water at 1atm boils in a stainless steel kitchen pan with $\Delta T_x = 8^{\circ}\text{C}$. Estimate the heat flux which will be obtained if the same pan operates as a pressure cooker at 0.17MPa, what percentage increases in heat flux might be expected? [10]

OR

9. A room $4 \times 4 \text{ m}$ square by $3 \times 3 \text{ m}$ height has one side wall maintained at 260°C ; the floor is maintained at 90°C . The other four surfaces are perfectly insulated assume that all surfaces are black. Calculate the net heat transfer between the hot wall and the cool floor. [10]

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10. Describe the process followed in design of a simple shell and tube heat exchanger. [10]

OR

11. In a food processing plant, a brine solution is heated from 8°C to 14°C in a double pipe heat exchanger by water entering at 55°C and leaving at 40°C at the rate of 0.18 kg/s . if the overall heat transfer coefficient is $800 \text{ W/m}^2\text{K}$, determine the area of heat exchanger required
- a) For a parallel flow arrangement, and
b) For counter flow arrangement. Take c_p for water $= 4.18 \text{ kJ/kgK}$. [5+5]

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R13

Code No: 126ER

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

SOFTWARE TESTING METHODOLOGIES

(Common to CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) What is meant by a software bug? Explain. [2]
- b) What is the intent of path based testing? [3]
- c) What are the complications with transaction flows? [2]
- d) What are the applications of data flow testing? Explain. [3]
- e) What is Interface testing? Give example. [2]
- f) What is the purpose of Domain Testing? Give its schematic representation. [3]
- g) What is decision table and how is a decision table useful in testing? [2]
- h) How can we check the consistency and completeness in the decision tables? [3]
- i) What are the applications of node reduction algorithm? [2]
- j) Differentiate between good state graphs and bad state graphs. [3]

PART - B

(50 Marks)

2. What are the consequences of bugs? To what extent can testing be used to validate that the program is fit for its purpose? Explain. [10]

OR

3. What is the purpose of testing? Discuss about various testing dichotomies with examples. [10]

4. Explain the Transaction Flow testing with an example. [10]

OR

5. Discuss the following strategies of data flow testing with suitable examples:

- a) All-predicate-uses (APU) strategy
- b) All-computational (ACU) strategy. [5+5]

6. What is meant by a nice domain? Give an example for nice two-dimensional domains. [10]

OR

7. Define the following concepts with respect to domain testing:

- a) Domains
- b) Domain dimensionality
- c) Domain closure
- d) Bug Assumptions for domain Testing [10]

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8. What is the looping probability of a path expression? Write arithmetic rules and explain with an example. [10]

OR

26 9. Describe the procedure for specification validation using KV charts. [10] 26 2

10. What are the principles of state testing? Explain its advantages and disadvantages. Mention design guidelines for building finite state machines into your code. [10]

OR

11. Write a detailed note on graph matrices and their applications. Write about the usage of Winrunner tools. [10]

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R09

Code No: 56015

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

ENVIRONMENTAL STUDIES
(Electrical and Electronics Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain any two biogeochemical cycles of ecosystem.
- b) Write about food chains and food webs. [10+5]
- 2.a) Describe the impacts of mining activities on nature.
- b) Write about Biofuels. [10+5]
- 3.a) Write about value of Biodiversity and describe the biodiversity conservation methods.
- b) Mention at least 5 endemic and 5 endangered species of India? [10+5]
4. Briefly explain the types, sources, effects and treatment technologies of waste water. [15]
- 5.a) Describe various international conventions and protocols.
- b) What are the impacts of climate change and write about ozone depleting substances? [5+10]
6. Explain Environmental Management Plan and Rain water harvesting methods. [15]
- 7.a) Write about Air and Water Acts.
- b) Describe Municipal waste handling rules. [10+5]
- 8.a) How can we achieve sustainable management?
- b) Write a note on Environmental education and Crazy consumerism. [10+5]

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R09

Code No: 56018

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

REFRIGERATION AND AIR CONDITIONING

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Write a short note on Bell-Coleman cycle.
- b) An aircraft refrigeration plant has to handle a cabin load of 30 tons. The atmospheric temperature is 17°C . Atmospheric air is compressed to a pressure of 0.95 bar and temperature of 30°C due to ram action. This air is then further compressed to 4.75 bar, in a compressor, cooled in a heat exchanger, to 67°C , expanded in a turbine to 1 bar and supplied to the cabin. Air leaves the cabin at a temperature of 27°C . The isentropic efficiencies of both, the compressor and turbine are 0.9. Calculate the mass of air circulated per minute and the COP. $C_p=1.005 \text{ kJ/kgK}$, $R=0.287 \text{ kJ/kgK}$ and $\gamma=1.4$ for air. [6+9]
- 2.a) An ammonia ice plant operates between a condenser temperature of 35°C to ice at -15°C . It produces 10 tons of ice per day from water at 30°C temperature of -5°C . Assume simple saturation cycle. Using only tables of properties for Ammonia, determine:
(i) the capacity of the refrigerant plant, (ii) the mass flow rate of refrigerant, (iii) the discharge temperature, (iv) The compressor cylinder diameter and stroke if its volumetric efficiency is $\eta_v=0.65$, rpm $N=1200$ and stroke/bore ratio $L/D=1.2$ (v) the horsepower of the compressor motor if the adiabatic efficiency of the compressor $\eta_a=0.85$ and mechanical efficiency $\eta_m=0.95$ and (vi) the theoretical and actual COP.
- b) How does actual vapor compression cycle differ from that of a theoretical cycle? [10+5]
- 3.a) What factors affect the capacity of an evaporator?
- b) "A completely odourless refrigerant is not desirable", discuss the statement. [8+7]
- 4.a) Describe in detail simple vapour absorption system.
- b) Why is the COP of VARS is poorer than that of VCRS? [8+7]
- 5.a) What is the working principle of Thermoelectric refrigerator explain its operating principle.
- b) Draw the T-S and h-s diagram of steam jet refrigeration system and state the advantages and disadvantages of steam jet refrigeration system over other types of refrigeration systems. [8+7]
- 6.a) What is the necessity of calculating ERSHF during the designing of the cooling coil?
- b) On a particular day, the atmospheric air was found to have a DBT of 30°C and WBT of 18°C . The barometric pressure was observed to be 756 mm of Hg. Determine the relative humidity, the specific humidity, the dew point temperature and the enthalpy of air per kg of dry air. [6+9]

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7.a) State the factors that determine in load estimation for comfort conditioning. Explain in detail.

26 26 26 26 26 26 26 2 [7+8]

b) Draw a neat diagram of a year round air conditioning system.

8.a) Write a short note on heat pumps.

b) How to provide cooling, heating humidification and dehumidification by using a single system. Explain. [6+9]

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R09

Code No: 56031

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, May - 2017

COMPILER DESIGN
(Computer Science and Engineering)

Time: 3 hours

Max. Marks: 75

Answer any five questions
All questions carry equal marks

- 1.a) Explain briefly about different phases of compiler.
b) Differentiate between pass and phase. [10+5]
2. Construct LL(1) parsing table for the grammar:
 $E \rightarrow E + T \mid T$
 $T \rightarrow T * F \mid F$
 $F \rightarrow id,$
Where E, T, F are variables and remaining symbols are terminals and E is a start variable, and also apply parsing program to accept the string $id+id*id+id$. [15]
3. Construct SLR parsing table for the grammar:
 $S \rightarrow L = R$
 $S \rightarrow R$
 $L \rightarrow *R$
 $L \rightarrow id$
 $R \rightarrow L$
Verify is there any shift-reduce or reduce-reduce conflicts in the parsing table. If any conflicts occur then verify whether conflicts are resolved in CLR parsing table. [15]
- 4.a) Explain different forms of intermediate code.
b) Write about syntax directed translation using an illustration. [8+7]
5. Explain the following terms:
a) Activation tree
b) Control stack
c) Activation Record. [5+5+5]
- 6.a) What is the criteria for code optimization? Explain.
b) Explain loop - optimization technique with an example. [7+8]
- 7.a) What is redundant sub-expression? How do you eliminate it? Explain with an example.
b) What is induction variable? How do you remove the induction variable in the process of optimization? [7+8]
- 8.a) Explain object code forms.
b) Write about machine dependent code optimization. [7+8]