

FACULTY OF ENGINEERING**B.E. 4/4 (Civil) I – Semester (Suppl.) Examination, May / June 2018****Subject: Water Resources Engineering – II****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A & any five questions from Part B.****PART – A (25 Marks)**

- 1 State the main purpose of creating Large Reservoirs in India. 2
- 2 What do understand by Auxiliary reservoir? 2
- 3 Compute the flood discharge passing from a spillway with coefficient of 2.3 and effective length of 160 m when head over the spillway is 3 m. 3
- 4 Distinguish between Coffor Dam and Gravity Dam. 2
- 5 Differentiate between Rolled filled and Hydraulic filled Earth Dam. 2
- 6 State the conditions suitable to locate Shaft Spillway. 3
- 7 The sequent depths at the D/S side of spillway is given as 1.2 m and 4.3 m when the width of river is 1 km. Determine the possible energy loss in KW and also the length of hydraulic jump at the site. 3
- 8 At a site proposed for runoff river plant, the head available on average is 6 m in a day. Compute the possible generating capacity of power generation per million cubic meters of flood water when efficiency is limited to 78%. 3
- 9 State the functions of cut off wall in an Earthen dam. 2
- 10 What is an Elementary profile of a Dam? Draw the line diagram with notations. 3

PART – B (5x10 = 50 Marks)

- 11 a) With help of neat sketch, explain construction of Mass Curve and how the reservoir capacity is fixed based on it. 4
- b) The runoff data at a site of reservoir is given below. What is the maximum demand that can meet from this reservoir to utilize all the available water and assuming that, compute the storage capacity of reservoir using mss curve method or analytically. 6

Month	January	February	March	April	May	June
Flow in $m^3 \times 10^6$	120	25	30	35	20	55
Month	July	August	September	October	November	December
Flow in $m^3 \times 10^6$	190	230	120	80	60	36

- 12 A masonry dam 18 m height is trapezoidal in section with top width 3.0 m and bottom width 24 m, the face exposed to water has a slope of 1:10. Test the stability of the dam. Compute the principle stresses at the toe and heel of dam. Assume unit weight of masonry as 24 kN/m^3 . The permissible stress of joint is 2300 kN/m^2 . Assume no free board. Consider reservoir full and reservoir empty condition. Assume any data required suitably. 10

- 13 a) What do you understand by Phreatic line? Derive the expression for Phreatic line graphically using Casagrande's method when a horizontal filter is provided for the Earthen dam with the help of a neat sketch. 5
b) Explain briefly the classification of Earthen dams with the aid of neat sketches. 5
- 14 a) Compute the effective length and height of water above the spillway which has a D/S slope of 0.7 H: 1V. The design discharge is 9000 cumecs. The average bed level is 160.0 m and spillway level is 220.0 m. The spillway comprises of 8 spans of 10 m each. Consider the thickness of each pier as 2.5 m. Also design the D/S profile of spillway. 5
b) With the help neat sketch, explain shaft spillway and state the conditions at which this spillway is preferred. 5
- 15 a) A storage river plant has installed capacity of 500 MW operates at 40% load factor when it serves as peak load station. What should be the minimum discharge in the penstock, so that it may serve as base load station? Assume plant efficiency of 80% when working under head of 60 m. Also calculate the maximum load factor of the plant when the discharge in the stream is 600 cumecs. 5
b) Explain the classification of Hydropower plants. 5
- 16 a) Explain various forces acting on gravity dams with appropriate figures and equations. List out the notations used in the equations clearly. 6
b) Explain how Jump Height Curve and Tail Water Curves are prepared and their purposes. 4
- 17 Write a detailed note on the following: 10
a) Selection of suitable site for Location of a Dam.
b) Design criteria for Filters in Earthen Dams.

FACULTY OF ENGINEERING**B.E. 4/4 (Inst.) I-Semester (Supplementary) Examination, May/June 2018****Subject : Opto-Electronic Instrumentation****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (25 Marks)**

- | | | |
|----|--|---|
| 1 | Mention the characteristics of mode-locking. | 2 |
| 2 | Give the characteristics of Laser stabilization. | 3 |
| 3 | Explain about beam modulation Telemetry. | 3 |
| 4 | Mention different biomedical applications of Laser. | 2 |
| 5 | What are the advantages of step index fibres and graded index fibres? | 2 |
| 6 | What is fundamental transmission theory? | 2 |
| 7 | Give classification of fibre optic sensors. | 2 |
| 8 | Classify optical fibre. | 3 |
| 9 | Mention the special features of LED. | 3 |
| 10 | Calculate the efficiency of a PIN diode if the responsivity is 0.58 A/W at 800 nm. | 3 |

PART – B (5 x 10 = 50 Marks)

- | | | |
|-------|--|----|
| 11 a) | With Energy level diagrams explain solid lasers. | 5 |
| b) | Explain with suitable diagram the working and construction features of Argon lasers. | 5 |
| 12 a) | With its constructional diagram explain different modes of operation of Laser strain gauges. | 5 |
| b) | Explain with neat diagram pulse echo technique. | 5 |
| 13 a) | Explain Holographic techniques of reconstructing a 2-D image. | 5 |
| b) | What is the procedure of fibre fabrication and manufacturing? Explain any one fabrication technique in detail with suitable diagram. | 5 |
| 14 a) | With necessary diagram explain how fibre optic sensors are classified. | 5 |
| b) | Explain how pressure is measured using optical fibres. | 5 |
| 15 a) | Describe the working and operation of Opto isolators. Explain how they are useful in an electrical circuit. | 5 |
| b) | Write short notes on solar cells and mention its applications. | 5 |
| 16 a) | Explain measurement of voltage and fluid level optical fibre. | 5 |
| b) | What are the major applications of Lasers in medicine? | 5 |
| 17 | Explain the following with relevant diagrams : | 10 |
| a) | Plasma Display | |
| b) | Photo transistor | |

FACULTY OF ENGINEERING**B.E. 4/4 (ECE) I-Semester (Suppl) Examination, May / June 2018****Subject: Industrial Administration and Financial Management****Time: 3 Hours****Max. Marks: 75****Note:** Answer All Questions From Part–A. Answer any FIVE Questions From Part-B**PART-A (25 Marks)**

1. List out various types of organization structures
2. What are the factors effecting plant layouts?
3. Define method study
4. Differentiate between job evaluation and performance appraisal
5. Give a brief note on control charts
6. Discuss about salient features of ISO
7. Define linear programming
8. How do you determine critical path?
9. List out different types of costs.
10. Briefly explain the concept of time value of money.

PART-B [50 Marks]

11. a) What are the various types of Business organizations? Explain any one of them.
b) Explain about functions of Management.
12. a) Define the terms time study, normal time, standard time and rating factor
b) List out different wage payment plans and explain any two of them.
13. a) Discuss in detail about the concept and significant aspects of statistical quality control.
b) Explain in detail about sampling plans
14. a) Differentiate between PERT and CPM techniques
b) Discuss about various duties of purchase manager
- 15 Draw Network diagrams and find the critical path and duration of the project with the following data

Activity	1-2	1-3	2-3	2-4	3-4	3-5	4-6	5-6
Duration (in days)	6	4	7	3	5	4	6	3

16. a) What is depreciation? And how do you calculate it?
b) Explain various techniques of capital budgeting.
17. Write short notes on any three of the following
 - a) Principles of motion Economy
 - b) Quality Circles
 - c) Assignment problems
 - d) Cost of capital

FACULTY OF ENGINEERING

B.E. 4/4 (M/P) I – Semester (Suppl.) Examination, May / June 2018

Subject: Finite Element Analysis

Time: 3 Hours

Max.Marks: 75

Note: Answer all questions from Part A. Answer any five questions from Part B.

PART – A (25 Marks)

- 1 Write the state of a stress at a point for axial, beam and in plane loading.
- 2 Write the properties of shape functions and stiffness matrices.
- 3 What are importance of direction cosines in truss analysis?
- 4 Sketch the Hermit shape functions.
- 5 Sketch the shape functions of CST element and explain their variation.
- 6 Write the 'D' matrix of a axisymmetric triangular element.
- 7 Explain the need of numerical integration and Gaussian quadrature.
- 8 Determine the equivalent load vector when the convection $h = 200 \text{ W/mm}^2 \text{ } ^\circ\text{C}$, $T = 1000 \text{ } ^\circ\text{C}$ is acting on face jk shown in Fig. 1.

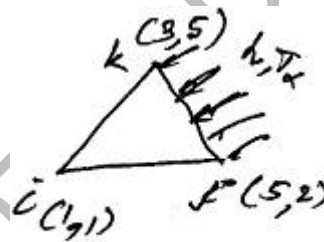


Fig. 1

- 9 Write the lumped mass matrix for axial and 2D beam element.
- 10 What are convergence requirements? Explain.

PART – B (5x10 = 50 Marks)

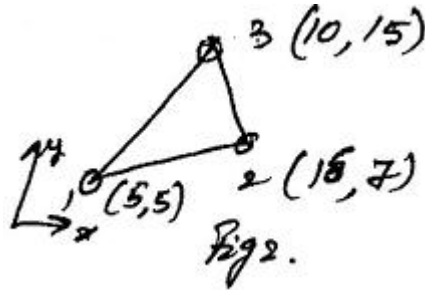
- 11 For the stepped shown in Fig. 1, $A_2 = 2A_1 = 10^{-6} \text{ m}^2$, $E = 200 \text{ GPa}$. Determine
 - i) The displacement
 - ii) The stresses in each element and
 - iii) The reaction forces.



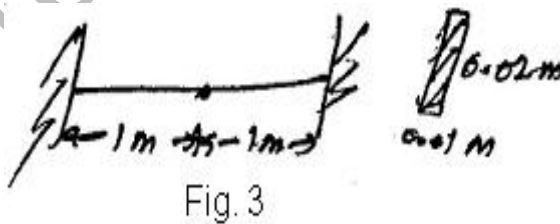
10

...2.

- 12 Derive the stiffness matrix for 2D truss, 2D beam and frame elements. 10
- 13 For the CST element shown in Fig. 2, determine the stiffness matrix under plane stress and plane strain condition if $t=1$ mm, $E = 200$ GPa, $\nu = 0.3$. 10



- 14 a) Derive the 'B' matrix for 3-nodes axisymmetric triangular element. 10
 b) Derive the 'B' matrix for 4-nodes quadrilateral element.
- 15 a) For Fig. 2, determine the conduction matrix if $K=50$ W/M °C. 10
 b) Numerically integrate, $I_c = \int_{-1}^1 (3\xi^2 - 2\xi + 10)d\xi$ and compare the solution by Gaussian quadrature, take, $n=1$, $w_1=2$, $\xi_1=0.0$; for $n=2$, $\xi_1 = \xi_2 = 1.0$, $\xi_1 = \xi_2 = \mp 0.577$. 10
- 16 For the beam element shown in Fig. 3, determine the natural frequencies and mode shapes by using two elements if $E=200$ GPa, $\rho=2500$ kg/m³. 10



- 17 Write the following: 10
 a) Galerkin's formulation for FE
 b) Stiffness matrix of 3D elements
 c) Formulation of torsional elements.

FACULTY OF ENGINEERING
B.E. 4/4 (AE) I - Semester (Suppl.) Examination, May / June 2018

Subject : Vehicle Maintenance

Time : 3 Hours

Max. Marks: 75

Note: Answer all questions from Part-A & answer any five questions from Part-B.

PART – A (25 Marks)

- 1 Explain schedule and unscheduled maintenance.
- 2 Explain Requirements of maintenance.
- 3 How do you differentiate maintenance and Repair?
- 4 What is cylinder honing process? Why it is done?
- 5 Explain troubles associated with gear box.
- 6 What is the reason for clutch not to be able to disengaging?
- 7 Why are fuses incorporated in a circuit ?
- 8 What is cell ignition?
- 9 What is the function of a engine cooling system?
- 10 Give reasons for the pulling of vehicle on one side on application of brake.

PART – B (50 Marks)

- 11 Explain various types of records books and forms that are being used in an automotive service station of cars.
- 12 Write the step by step procedure of overhauling a multi cylinder petrol engine.
- 13 Briefly explain various troubles that may occur in a single plate dry clutch system and bring out their causes.
- 14 Explain the maintenance procedure and the various tests to be conducted on a 4 lead acid battery of a vehicle.
- 15 Explain checking and servicing of dash board instruments.
- 16 What is meant by calibration of fuel injection pump? Explain calibration of FIP and tuning of engine for optimum fuel supply.
- 17 Explain the following:
 - (a) Lubrication maintenance
 - (b) Door locks and window glass actuating maintenance.

FACULTY OF ENGINEERING AND INFORMATICS

B.E. 4/4 (CSE/IT) I-Semester (Suppl) Examination, May/June 2018
Subject: Information Security

Time: 3 Hours

Max. Marks: 75

Note: Answer All Questions From Part-A & Any five Questions From Part-B.

Part – A (25 Marks)

- | | |
|---|---|
| 1. What are the various characteristics of information? | 3 |
| 2. Differentiate between DoS and DDoS | 2 |
| 3. Define : Residual Risk | 2 |
| 4. Write short notes on Policy Vs law | 3 |
| 5. What is information security Blueprint? | 2 |
| 6. Write about VPNs. | 3 |
| 7. Define cryptography and Cryptanalysis | 2 |
| 8. Differentiate symmetric and Asymmetric Encryption. | 3 |
| 9. Write about internal control strategies | 3 |
| 10. What is Bull's eye model? | 2 |

PART –B (5x10 = 50 Marks)

- | | |
|---|----|
| 11. What is a threat? Explain the different types of threats in detail? | 10 |
| 12. Explain the various Risk control Strategies in detail? | 10 |
| 13. Briefly explain the categorization of firewalls | 10 |
| 14. What is IDPS? Explain the various types of IDPS and its detection methods in detail? 10 | 10 |
| 15. Explain the various steps involved in information security project management? | 10 |
| 16 a) Outline any five attacks | 5 |
| b) Discuss about the Risk Assessment | 5 |
| 17. Write short notes on the following: | |
| a) Digital signatures | 4 |
| b) Triple DES | 3 |
| c) Digital Forensics | 3 |

FACULTY OF ENGINEERING**B.E. (Civil) IV - Semester (CBCS) (Main) Examination, May/June 2018****Subject : Surveying – II****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (20 Marks)**

- 1 What are the sources of errors in theodolite? (2)
- 2 Explain the temporary adjustments of a theodolite. (2)
- 3 What are the different types of EDM instruments used for surveying? (2)
- 4 What is axis signal correction? (2)
- 5 What is versed sine of a curve? Express it mathematically. (2)
- 6 What are the essential requirements of a transition curve? (2)
- 7 What is tangent correction? (2)
- 8 Why do you prefer parabola as a vertical curve? (2)
- 9 Briefly explain the components of a GIS. (2)
- 10 List out the advantages of aerial photogrammetry. (2)

PART- B (50 Marks)

- 11 (a) Describe the various parts of a transit vernier theodolite with a neat sketch. (5)
(b) Describe the method of repetition for measurement of horizontal angle by theodolite. (5)
- 12 (a) State the various methods of balancing a closed traverse. Explain any one method in detail. (4)
(b) Find the R.L of Q from the following observation:
Horizontal distance between P and Q = 9290m, Angle of elevation from P and Q = $2^{\circ} 6' 18''$, Height of signal at Q = 3.96m, Height of instrument at P = 1.25m Coefficient of refraction = 0.07, $R \sin 1 = 30.88\text{m}$, R.L of P = 396.58m (6)
- 13 (a) What are the different methods of setting out simple circular curves. Briefly explain them. (4)
(b) Two straights AB and BC intersect at a chainage of 4242.00m. The angle of deflection is 140° . It is required to set out a simple circular curve of radius 150m to connect the straights. Calculate all the data necessary to set out the curve by the method of offsets from the chords produced with an interval of 30m. (6)
- 14 (a) How do you calculate length of summit curve for stopping sight distance? (5)
(b) An ascending gradient of 1 in 100 meets a descending gradient of 1 in 120. A summit curve is to be designed for a speed of 80kmph so as to have an overtaking sight distance of 470m. (5)
15. What is GPS? What are its components? Briefly explain the principle of GPS and its types. (10)
- 16 (a) Differentiate between fixed hair and movable hair method of tacheometry. (5)
(b) Derive the relation between radius and degree of a curve. (5)
- 17 Write short notes on: (10)
(a) Refraction and curvature corrections.
(b) Applications of Remote Sensing in Civil Engineering
(c) Advantages of total station.

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) (EEE) (Main) Examination, May / June 2018

PAPER:- Power system - I

Time:3 Hours

Max Marks :70

Note: Answer all questions in Part-A & Any five questions from Part-B.

Part-A (20 Marks)

1. What is diversity factor and how does it influence the cost of generation? 2M
2. Discuss the disadvantages having low power factor. 2M
3. What is the purpose of surge tank in a hydro power plant? 2M
4. Draw the flue gas flow diagram. 2M
5. Differentiate between fertile and fissile materials. 2M
6. Mention various types of solar plate collectors. 2M
7. What are the advantages of cables over overhead lines? 2M
8. Name the tests which will be conducted on insulators. 2M
9. Define self GMD and mutual GMD. 2M
10. What is skin effect? 2M

Part-B (50 Marks)

11. a) A plant costs Rs.85, 000 and has a useful life of 20 years. What amount should be saved annually to replace the equipment at the end of its useful life by sinking fund method, the annual rate of compound interest being 6%? Assume the salvage value of the equipment to be Rs. 5000. 5M
- b) Explain various types of tariffs. 5M
12. a) What is meant by a pumped storage plant? Explain its working. 5M
- b) Write a brief note about
 - i) Economizer (ii) Super heater (iii) Air pre heater 5M
13. a) With a neat sketch explain the working of a gas turbine power plant. 5M
- b) Explain the essential factors which influence the choice of site for a Nuclear power plant. 5M
14. a) Define sag. Derive the expression for sag with the effect of wind and ice loading. 5M
- b) A 33 kV line is supported on a string of three similar insulators, the neutral capacitance of which across the units is 9 times the shunt capacitance between the unit and earthed frame work. Calculate the voltage across each insulator. 5M
15. a) Derive the expression for loop inductance of a 1- line. 5M
- b) The three conductors of a 3- , 3-wire line are arranged at the corners of a triangle, the sides of which are 1m, 1.3m and 2m. Calculate the inductance and capacitance per km of the line, when the conductors are transposed. The conductors have 1.5 cm diameter. 5M
16. a) Derive the expression for the most economical power factor that can be achieved by a consumer. 5M
- b) Explain the working of any two types of Nuclear reactors. 5M
17. Write short notes on the following:
 - a) Transposition of conductors. b) Capacitance grading of cables. 5M

FACULTY OF ENGINEERING**B.E IV-Semester (CBCS)(Inst) (Main) Examination, MAY /June 2018****Subject : Transducer Engineering****Time: 3 Hours****Max Marks: 70****Note:** Answer all questions from Part-A & Any Five questions From Part-B.**Part-A**

1. Define linearity and calibration. [2]
2. What are inductive transducers? Give one example. [2]
3. Define Second order system and give its transfer function. [2]
4. List applications of capacitive transducer. [2]
5. A resistance wire strain gauge uses a soft iron wire of small diameter. The gauge factor is +4.2. Neglecting the piezo resistive effects, calculate the Poisson's ratio. [2]
6. Define proximity transducer. [2]
7. What is thermopile? [2]
8. Explain law of thermocouple. [2]
9. Write a note on C-type bourdon tube. [2]
10. Define capsule. [2]

PART-B

11. a) Derive the frequency response for a first order system with a) Unit step input. [10]
b) Unit ramp input
12. a) Explain the technique of temperature compensation in strain gauge circuits. [5]
b). Describe the constructional details of potentiometer. [5]
13. a) Derive an expression for the thickness measurement $\left(\frac{\Delta d}{d}\right)$ using the principle of variable capacitance. [5]
b) Explain how the transducers are classified. List out the Transducers [5]
14. a) Explain in detail capacitive hygrometer. [5]
b) Explain the technique of liquid level measurement using capacitive transducer. [5]
15. a) Explain in detail RTD in detail with relevant diagram. [6]
b) Differentiate between RTD and Thermistor. [4]
16. a) A compressive force is applied to a structural member. The strain is 5 micro-strains. Two separate strain gauges are attached to the structural member; one is a nickel wire strain gauge having gauge factor -12.1 and other is nichrome wire strain gauge having a gauge factor of 2. Calculate the value of resistance of the gauges after they are strained. The resistance of strain gauges before being strained is 120 . [6]
b) Write the advantages and disadvantages of LVDT. [4]
17. Write a short note on
a) Dead weight gauge. [5]
b) Semiconductor strain gauge. [5]

FACULTY OF ENGINEERING

B.E. IV Semester (CBCS) (ECE) (main) Examination, May/June 2018

Subject: Probability Theory and Stochastic Process

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions from Part A & Any Five questions from Part B

PART – A (20 Marks)

1. Define a Random variable and state the condition for a function to be the random variable. 2
2. A fair dice is tossed. The following events A and B are defined as follows.
 $A = \{x: x \text{ is even}\}$, $B = \{x < 4\}$, $N = \{x < 4\}$, Find $P(A \cup B)$, $P(A \cap B)$ 2
3. State any three properties of Probability distribution function $F_x(x)$ of a Random variable X 2
4. Find the Mean square value of a uniformly distributed Random Variable between 2 and 10 2
5. Define Correlation and Co-variance of two random variables X and Y 2
6. Briefly explain the Joint Characteristic function of two random variables X and Y 2
7. Explain the concepts of Stationary and Ergodicity 2
8. Explain the concepts of Stationary Random process is given by $X(t) = e^{-at}$ find $E[X^2(t)]$. 2
9. State the relation between Power density spectrum and autocorrelation function of a Random process. 2
10. State any two properties of a Power density spectrum of a Random process. 2

PART – B (5 x 10 = 50 Marks)

11. (a) State the axioms of the Probability. 3
 (b) Box 1 contains 20 resistors and 30 capacitors, Box 2 contains 40 Resistors and to Capacitors. One box is first selected randomly and next one component is picked randomly from the selected box. The boxes are picked up with equal probability. If the component turns out to be capacitor find the probability and that it comes from Box 2. 7
12. (a) X is an exponentially distributed random variable with $f_x(x) = 2e^{-2x}$ $x \geq 0$. Find Mean of Y if $Y = X^2$ 5
 (b) A box contains 1000 transistors, ten person of which are defective. Assuming Poisson distribution, Find the probability that the box contains more than four defective transistors. 5
13. X is a Rayleigh's distributed random variable. Find $F_x(x)$, mean of X and variance of X. 10
14. (a) Derive an expression for the probability density of Sum of two random variables X And Y . 5
 (b) The Joint density function of two random variable X and Y is given by
 $f_{xy}(x,y) = x(y+1.5)$, $0 < x < 1$, $0 < y < 1$
 0 , elsewhere Find $E(XY)$. 5
15. (a) Define and discuss First order stationary random and Second order wide sense stationary random process 4
 (b) Show that the Random process $X(t) = A_c \cos(\omega_c t + \phi)$, Where A_c and ω_c are Constants and ϕ is a uniformly distributed random variable between $(0, 2\pi)$ is a Wide sense stationary random process. 5

contd...2..

16. (a) The random process $S(t)$ has power spectrum $S_{xx}(\tilde{S}) = 4 - \frac{\tilde{S}^2}{9}; |\tilde{S}| \leq 6$
 $= 0$; Elsewhere

Find the average power of $X(t)$

6

(b) Define white noise and discuss its Autocorrelation function

4

17. (a) Write short note on

a) Central limit theorem

b) Bayes theorem

c) Chebychev's inequality.

10

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FACULTY OF ENGINEERING
B.E IV-Semester (CBCS) (Mech) (Main) Examination, May / June 2018

Subject: Applied Thermodynamics

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions from Part A and any five questions from Part –B

PART-A (20 Marks)

1. Classify compressors
2. Explain the use of intercooler in compressors
3. What is wet sump and dry sump lubrication.
4. Define specific fuel consumption.
5. Define Octane number.
6. What is ignition delay in engine combustion.
7. What are boiler mountings give examples.
8. What are supercritical boilers.
9. Sketch Rankine cycle
10. What is critical pressure ratio in nozzles.

PART-B (5X10=50 Marks)

- 11 (a) Derive the expression for work done in a single stage reciprocating air compressor and sketch P-V graph.
 (b) Determine the size of the cylinder for a double acting air compressor 40kW indicated power, In which air is drawn in at 1 bar and 15⁰C and compressed according to the law $PV^{1.2}=\text{constant}$ to 6 bar. The compressor runs at 100rpm with average piston speed of 152.5 m/mjn .neglect Clearance.
- 12 (a) Explain with the help of a sketch the working of magneto ignition system.
 (b) A single cylinder engine running at 1800rpm develops a torque of 8Nm. The indicated power of the engine is 1.8kw. Find the loss due to friction power as the percentage of brake power.
- 13 (a) Explain the stages of combustion in SI engine.
 (b) Define phenomenon of knocking in CI engine and mention effects of knocking.
- 14 (a) Explain with the help of neat sketch
 (i) Economiser (ii) Superheater (iii) safety valve
 (b) Differentiate between jet and surface condensers.
- 15 (a) Explain Rankine cycle with reheating.
 (b) Steam is expanded in a set of nozzles from 10 bar and 200⁰c to 5bar. What type of nozzle is it? Neglecting the initial velocity find minimum area of the nozzle required to allow a flow of 3kg/s. Under the given conditions. Assume that expansion of steam to be isentropic.
- 16 (a) What is the effect of clearance volume on efficiency of compressor
 (b) sketch and explain diesel engine injection pump.
- 17 (a) Sketch any two types of combustion chambers for CI engine
 (b) Sketch and explain lancashire boiler
 (c) Explain the phenomenon of flow of steam through convergent- divergent nozzle.

FACULTY OF ENGINEERING**B.E. IV-Semester (CBCS) (Prod) (Main) Examination, MAY / JUNE 2018****Subject: Applied Thermodynamics and Heat Transfer****Time: 3 Hours****Max. Marks: 70**

Note: Answer All Questions From Part - A and Any Five Questions From Part-B.
Assume suitable data, if required for solving the Numericals.

PART-A (20 Marks)

1. Define Isothermal efficiency, volumetric efficiency and write why the volumetric efficiency decreases with increase in delivery pressure.
2. Distinguish between "single stage" and "Multi stage" air compressors.
3. Why the actual cycle efficiency is much lower than the air standard efficiency? List the major losses in an actual engine.
4. Mention the usefulness of drawing up a "heat balance sheet" on an IC engine.
5. What is meant by carburetion and write the various types of carburetors?
6. Define "cetane number" as applied to a C.I engine fuel.
7. State the Fourier's law of conduction heat transfer.
8. Explain the significance of critical radius of Insulation.
9. Define absorptivity, reflectivity and transmissivity.
- 10 Distinguish between "parallel flow" and "counter flow" heat exchangers.

PART-B (5x10=50 Marks)

11. A single-stage double-acting air compressor is required to deliver 14m^3 of air per minute measured at 1.013 bar and 15°C . The delivery pressure is 7 bar and the speed is 300 rpm. Take the clearance volume as 5% of the swept volume with the compression and expansion index of $n=1.3$. Calculate (a) swept volume of the cylinder (b) The delivery temperature (c) indicated power.
12. With the help of sketches explain the reasons of Deviation of actual cycles from air standard cycles.
13. (a) Briefly explain the various stages of combustion in S.I. Engines.
(b) Describe the working principle of a simple carburettor.
14. A wall of 0.5m thickness is to be constructed from a material which has an average thermal conductivity of 1.4 W/mk . The wall is to be insulated with a material having an average thermal conductivity of 0.35W/mk so that the heat loss per square meter will not exceed 1450W . Assuming that the inner and outer surface temperatures are 1200°C and 15°C respectively. Calculate the thickness of insulation required
- 15 a) Explain Buckingham ham - π - theorem, also explain the significance of different non-dimensional numbers.
b) Derive the LMTD equation for parallel flow heat exchange.

- 16 a) What do you mean by multistage compression in Air compressors? State its advantages.
b) Explain the water cooling method of IC engines.
17. Write short notes on :
(a) Effect of clearance volume on work done and efficiency in reciprocating air compressor.
(b) Lubrication systems of an IC engines
(c) Stefan- Boltzman law.

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FACULTY OF ENGINEERING**B.E IV-Semester (CBCS) (A.E) (Main) Examination, May / June 2018****Subject: Metallurgy and Material Testing****Time: 3 Hours****Max. Marks: 70**

Note: Answer all questions from Part A and any five questions from Part -B

PART-A (20 Marks)

1. Explain the terms "Recrystallisation" and "Recrystallisation temperature".
2. Differentiate ductile fracture with brittle fracture. With neat sketch.
3. What is low cycle fatigue?
4. State and explain Fick's 2nd law of diffusion.
5. Distinguish the terms solid solution, compound and mixture with examples.
6. Draw and explain the cooling curves for pure metal and solid solution alloys
7. Explain the Normalizing heat treatment process.
8. Differentiate carburizing with nitriding process.
9. State the differences between destructive and non-destructive tests.
10. Differentiate Hardness with Hardenability.

PART-B (5 x 10 = 50 Marks)

11. a) What are line defects? Explain two types of dislocations in detail.
b) Explain the mechanism of plastic deformation in metals.
12. a) What is Fatigue? Explain various factors which affect the fatigue life of a material.
b) Discuss the applications of diffusion in mechanical engineering field.
13. a) Discuss Hume-Rothery's rules for the formation of substitutional solid solutions.
b) Draw a binary phase diagram where in two components are completely soluble in liquid state but insoluble in solid state. Label the important points, lines and phases on it. Explain the solidification of any alloy under consideration.
14. a) Draw Iron-Iron carbide equilibrium diagram and label all points, line and areas of significance.
b) Explain the invariant reactions in Fe-Fe₃C system.
15. a) Mention different hardness tests. Describe Rockwell hardness test with suitable sketch.
b) Explain ultrasonic testing of materials for detecting the flaws.
16. a) Explain creep behavior of materials with a neat sketch.
b) How cast irons are classified? Explain the manufacture of malleable cast iron.
17. Write short notes on the following
 - a. Induction hardening
 - b. Izod impact test
 - c. Bauschinger effect

FACULTY OF ENGINEERING**BE IV- Semester (CBCS) (CSE) (Main) Examination, May / June 2018****SUBJECT: OOP USING JAVA****TIME : 3HOURS****MAX. MARKS: 70**

Note : Answer All Questions from Part-A , & Any five Questions From Part-B

Part – A(20Marks)

1. Write a java program using this() to invoke current class constructor. 2M
2. Explain the significance of each word in public static void main(String args []) 2M
3. Discuss various methods used to create threads. 2M
4. Name some of the string handling methods. 2M
5. What are legacy classes? 2M
6. What is comparator? 2M
7. Explain the use of layout managers. 2M
8. What is event delegation model? 2M
9. Briefly discuss about serialization. 2M
10. Give an example of opening a file and print its content on the console. 2M

Part-B (50Marks)

- 11.(a) Explain the control statements used in JAVA 5M
 - (b) Explain how to create a package and import a package with suitable example. 5M
- 12.(a) What is object oriented development ?Discuss its advantages. 5M
 - (b) Give an example for declaring an array in JAVA and accessing it. 5M
- 13.(a) What is an Exception? Explain how exceptions are handled in JAVA with suitable example. 5M
 - (b) What is synchronization? Explain with example. 5M
- 14.(a) Use comparator interface in collecting framework to sort a list of names in ascending order. 5M
 - (b) Explain the different iterators used for accessing the elements with example. 5M
- 15.(a) Explain the usage of grid layout. 5M
 - (b) Explain the steps involved in creation and handling of menus. 5M
- 16.(a) Write a java program to print last n lines of a given text file. 5M
 - (b) Discuss briefly about java I/O classes. 5M
17. Write short notes
 - (a) Interface. 4M
 - (b) String Tokenizer 3M
 - (c) Hashmap. 3M

FACULTY OF INFORMATICS
B.E. (CBCS)(I.T) IV Semester (main) Examination, June 2018

Subject: OOP using Java

Time: 3 Hours

Max. Marks: 70

Note: Answer all questions from Part A & Any Five questions from Part B
PART – A (20 Marks)

1. What is the usage of this keyword in java?
2. Discuss: Java programs are Portable.
3. Write about any two uses of final keyword.
4. What is meant by method Overriding?
5. Differentiate between throw and throws keywords.
6. How do you create a new thread in a java program?
7. What is Object Serialization in java?
8. What is Applet Life Cycle.
9. What is Applet Byte and Character Stream?
10. What is the use of Alive() and join() methods.

PART – B (5 x 10 = 50 Marks)

- | | |
|--|----|
| .11. (a) Discuss in detail about Object Oriented Concepts with suitable examples. | 5 |
| (b) What are overloaded constructors? Write a program to demonstrate them. | 5 |
| 12. Explain in detail about Dynamic Dispatch(DMD) in java. Write a program to show how Java resolves calls to overridden methods at run time in inheritance hierarchy? | 10 |
| 13.a) What is an Exception? How does a java program handle the Exception, write about all exception handling keywords used in java. | 5 |
| (b) Write a program to define user defined exception classes in Java. | 5 |
| 14. (a) Explain the difference between process based multitasking and Thread based multitasking. Write a program to access current default thread. | 6 |
| (b) Write about visibility control mechanism offered by Package in association with java's access specifiers. | 4 |
| 15. (a) What is Serialization in Java? Explain in detail using different classes and interfaces involved in Serialization and write the program. | 6 |
| (b) Write a program to cycle through contents of an array List collection using Iterator. | 4 |
| 16. Illustrate about Delegation Event model and write a program to demonstrate Keyboarded Event Handling | 10 |
| 17. Write about following | 10 |
| a) AWT controls b) Array List Collection Class | |
| c) Applets d) Interfaces in Java. | |
