Code No: 2047/BL

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) II-Semester (Backlog) Examination, November 2020

Subject : Fluid Mechanics - I

Time: 2 Hours **Max. Marks: 75**

Note: Answer any seven Questions From Part-A & Any three Questions From Part-B.

PART- A (7x3=21 Marks)

1. Define Buoyancy
2. Distinguish between body force and surface forces
3. State the principle involved in manometers for measuring pressure
4. Define Isothermal process
5. Lit out four minor losses occuring in pipes
6. Distinguish between uniform flow and non uniform flow
7. Write the euler's equation of motion in one dimensions
8. Write the differences between weir and a notch
9. Define with sketch mach cone and mach angle
10. Distinguish between pipes in series and in parallel

PART – B (3x18=54 Marks)

11 a) State Pascal's law and explain the principle of buoyancy
   b) The velocity potential function is given by 5 (x^2 - y^2). Calculate the velocity components at point (3, 5)

12 a) Derive Euler's equation of motion in 3-dimensiors. State the assumptions
   b) A nozzle of diameter 20mm is fitted to a pipe of diameter 40mm, Calculate the force exerted by the nozzle on water which is flowing through a pipe at the rate of 2m^3/min

13 a) Explain the working of a Rota meter with a neat sketch
   b) Find the discharge of water flowing through a rectangular notch of 2m length when constant head over notch is 30 cm. Take Cd as 0.6 Assume two sharp end contractions.

14 a) Derive Bernoulli's equation for Iso thermal process state the assumptions
   b) A projectile is travelling in air having pressure and temperature as 8.8 N/cm^2 and 10^{o}c, at a speed of 1200 kmph. Calculate the mach number and mach angle.

15 a) Derive an expression for head loss done to friction in turbulent flow through circular pipes.
   b) A fluid of viscosity o.8 N.s/m^2 and specific gravity 1.4 is flowing through a circular pipe of diameter 10cm, the maximum shear stress at the pipe wall is 196 N/m^2. Calculate pressure gradient and sketch it

16 a) Derive impulse momentum equation applied to flow through a bead of different diameters. State the assumptions.
   b) State the importance of Reynolds experiment and also explain it with a neat sketch

17. Write short notes on two of the following
   a) Surface tension b) Nozzle meter c) Stagnation point

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Code No.2053/BL

FACULTY OF ENGINEERING

B. E. 2/4 (EEE/Inst.) II – Semester (Backlog) Examination, November 2020

Subject: Electro Magnetic Fields

Time: 2 hours **Max. Marks: 75**

Note: Answer any seven Questions From Part-A & Any three Questions From Part-B.

PART- A (7x3=21 Marks)

1. Find F between Q_1=10μC at (0, 1, 3) and Q_2=(-20 μC) at (1, 0, 0) in magnitude and direction.
2. Define Scalar and Vector fields with examples.
3. Explain electric boundary conditions.
4. Write the formula for Energy stored in electric field and write unit of each terms.
5. Explain Faradays Laws of Electromagnetic Induction.
6. What is self and mutual inductance and their units?
7. Write any two Maxwell's equation in point form for Static field.
8. Derive continuity equation.
9. Explain TEM.
10. What is skin depth?

PART – B (3x18=54 Marks)

11. (a) Derive E for infinite ling charge.

    (b) What are the different coordinate systems used to represent field vectors? Discuss about spherical co-ordinate system in brief.

12. (a) Derive energy stored in an electric field.

    (b) Write types of charges.

13. (a) Explain magnetic boundary conditions.

    (b) Find H at the origin due to current element IdL = 3Π(ax+3az)μAm at point P (3,4,5) in free Space.

14. Differentiate conduction and displacement current and derive the same.
15. Derive EM waves for free space from fundamentals.
16. (a) Determine the electric field intensity of P(-0, 2, 0, -2.3) due to a point charge of +5nC at Q(0.2, 0.1, -2.5) in air. All dimensions are in meters.

    (b) A circular disc of radius 'a' m charged uniformly with a charge density of ρ_s C/m^2. Find the electric field at a point 'h' m from the disc along its axis.

17. (a) Calculate B and H due to a long solenoid.

    (b) Derive uniqueness theorem.

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Code No: 2061/BL

FACULTY OF ENGINEERING

BE 2/4 (ECE) II- Semester (Backlog) Examination, November 2020

Subject : Networks and Transmission Lines

Time: 2 hours **Max. Marks: 75**

Note: Answer any seven Questions From Part-A & Any three Questions From Part-B.

PART- A (7x3=21 Marks)

1. Differentiate between image, iterative impedance in asymmetrical networks.
2. Define image transfer constant and iterating transfer constant of a Network.
3. What is Notch filter? Where it is used?
4. What are the advantages of m-derived filters over k-filters?
5. Explain the need for impedance matching networks.
6. List the properties of Positive real function.
7. What is transmission line? Draw its equivalent circuit at low and high frequencies.
8. Define Phase velocity and group velocity.
9. What are the applications of Smith chart?
10. Write on the characteristics of a quarter wave transmission Line.

PART- B (3X 18 = 54 Marks)

11. (a) Obtain the expression for image impedance of a Asymmetrical L-network.
    (b) Draw the T and Pi Network. Derive relation between T and Pi Network.

12. (a) Explain how an m-derived filters are obtained form constant k-type filter. Explain both low and high pass cases and draw the clear circuits in each case.
    (b) What is composite filter and draw its various sections.

13. (a) Differentiate between various methods of Network synthesis.
    (b) The driving print impedance of a LC network is given by $Z(s)= (S^4 +4S^2 +3) / (S^3 +2S)$. Determine the second cauer form of the network

14. (a) Derive an expression for input impedance of a finite length transmission line .
    (b) A 12 kms line terminated by its characteristics impedance. At certain frequency the voltage at 1km from the sending end is 10% below that at the sending end. Find the voltage across the load impedance in terms of percentage of sending end voltage.

15. Compare limitations of single stub and double stub matching method. Give the steps Involved in design of single stub matching.

16. (a) Find the Open and short circuit impedance of T-network.
    (b) Derive the condition for distortion-less transmission line.

17. Write short notes on
    (a) Network synthesis methods.
    (b) Insertion loss and attenuation

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Code No: 2067/BL

FACULTY OF ENGINEERING
BE 2/4(M/P) II Semester (Backlog) Examination, November 2020

Subject: Basic Electronics

Time: 2 Hours **Max. Marks: 75**

Note: Answer any seven Questions From Part-A & Any three Questions From Part-B.

PART- A (7x3=21 Marks)

1) Define Diffusion current
2) What are ripples in rectifiers? How do we rectify the ripples?
3) Can two diode connected in back to back work as BJT? Justify your answer.
4) What is Amplification factor of JFET?
5) What is Barkhausen Criteria for Sustained Oscillations?
6) What are the advantages of negative feedback?
7) Draw the equivalent circuit of OP-AMP
8) Implement AND gate using only NAND gates
9) What is a photo diode? Can we use the photo diodes for solar panel construction?
10) Mention differences between LED and LCD.

Part - B (3x18=54 Marks)

11) a. What is Hall Effect? Derive an equation for Hall Voltage.
    b. Explain the working of Zener diode as regulator.

12) a. What are the differences between CE, CB and CC configurations of BJT?
    b. Draw the symbol of JFET and explain the purpose of Gate Drain and Source.

13) a. Draw the Colpitts Oscillator and Derive the Equation for Frequency of Oscillations.
    b. Draw the circuit for Voltage series feedback amplifier and Write equations for the input and output Impedance.

14) a. Draw the Op-Amp as Differentiator and derive the equation for output.
    b. Draw the Op-Amp as Integrator and derive the equation for output.

15) a. Explain the Construction and working of C R O.
    b. Mention applications of CRO.

16) a. Explain the construction of UJT.
    b. Draw and explain the V-I characteristics of UJT.

17) Write short notes on
    a. Applications of diode
    b. LVDT
    c. SCR

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Code No.2071 /BL

FACULTY OF ENGINEERING

B.E. 2/4 (A.E) II-Semester (Backlog) Examination, November 2020

Subject : Thermal Engineering

Time : 2 hours **Max. Marks : 75**

Note: Answer any seven Questions From Part-A & Any three Questions From Part-B.
Use of steam tables is permitted

PART- A (7x3=21 Marks)

1 Define change of state, process and cycle.
2 What is PMM-I.(I-is numeric numbers)
3 What is Clausius Inequality
4 State Second law of Thermodynamics
5 What is dryness fraction of Steam? Mention its values for wet and superheated steam.
6 Distinguish between Nozzle and Diffuser
7 What is free air delivered?
8 Draw reversed Carnot cycle on P-V and T-S diagrams.
9 State Fourier law of heat conduction.
10 Explain the concept of Black body.

PART – B (3x18=54 Marks)

11 a) Explain Thermodynamic equilibrium.
b) 1 kg of gas at 25^0C occupying a volume of 2 m^3 is heated at constant pressure to 200^0C. Find head added, work done and change in internal energy. Take Cv=0.728 KJ/kg-k, Cp=0.984 KJ/kg-k. Also calculate the final volume.

12 a) Differentiate between Heat engine, heat pump and a refrigerator
b) A Reversible heat engine receives heat from a reservoir at 700^0C and rejects at temp T2. A second reversible engine receives the heat rejected by the first engine and rejects to a sink at 37^0C. Calculate T_2 for equal work output of both the engines. Also calculate the efficiency of each engine.

13 Explain Brayton Cycle with the help of a Schematic diagram and derive an expression for the thermal efficiency of the cycle.

14 a) Show that energy is a property of a system.

b) State and prove Carnot theorem

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15 a) What do you understand by Multistage compression? What are its merits over single stage.

b) Explain simple Vapour Compression Refrigeration System with a neat sketch

16 a) What are the desirable properties of an ideal refrigerant

b) A large window glass 0.5 cm thick (k=0.78 W/mK) is exposed to warm air at 25^0C, over its inner surface, with convection coefficient of 15 W/m^2K. The outside air is at -15^0C with convenction coefficient of 50 W/m^2k. Determine the heat transfer rate and temperature at the inner and outer surface of the glass.

17 a) What are the three modes of heat transfer? Explain them with suitable examples.

b) A counter flow heat exchanger is required to cool 55000 kg/h of oil from 66^0C to 40^0C using 40000 kg/h of water entering at 5^0C. Determine i) Exit temperature of water, ii) heat transfer rate and iii) surface area required.

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Code. No. 2074/BL

FACULTY OF ENGINEERING

B.E. 2/4 (CSE) II-Semester (Backlog) Examination, November 2020

Subject : Microprocessor and Interfacing

Time: 2 Hours **Max. Marks: 75**

Note: Answer any seven Questions From Part-A & Any three Questions From Part-B.

PART- A (7x3=21 Marks)

1. Write the Rotate instructions of 8085 with examples
2. List all flags available in 8085
3. Summarize the significance of DMA
4. Explain about vectored interrupts of 8085
5. Specify handshake signals and their functions if port A of 8255A is setup as an output port in mode 1
6. What is 2 key lockout and N key rollover?
7. List out the specifications of 8051
8. List four major differences between microprocessors and micro controller
9. Give any two examples for 16 bit microprocessor and mention its objectives
10. Explain Instruction set of 80386 microprocessor

PART – B (3x18=54 Marks)

11. a Explain 40 pin diagram of 8085 microprocessor
    b. How AD_0-AD_7 operates as multiplexed bus? Explain

12. a. Draw and explain programmable Interrupt Controller 8259A
    b. Explain conditional CALL and RETURN instructions of 8085

13. a. Explain the operation of Programmable Peripheral Interface (8255) with neat diagram
    b. List and explain signals of RS 232C serial Interface

14. a. How the serial data communication is performed in 8051? Explain various of operation and SFR's used for serial data communication.
    b. Describe the Interfacing of 8051 keyboard.

15. a. In detail explain advanced design features of microprocessors.
    b. Compare 80186 and 80286 microprocessors.

16. a. Write the format of ICW and OCWs of 8259 PIC.
    b. Differentiate Branch and Subroutines.

17. a. Explain operation of programmable communication Interface.
    b. Explain all registers used in 8051 micro controller.

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Code No.2079/BL

FACULTY OF ENGINEERING

B. E. 2/4 (IT) II – Semester (Backlog) Examination, November 2020

Subject: Computer Organization & Microprocessors

Time: 2 hours **Max. Marks: 75**

Note: Answer any seven Questions From Part-A & Any three Questions From Part-B.

PART- A (7x3=21 Marks)

1. What is a Bus? Draw the Bus structure that connects processor, memory, IO devices.
2. Write the advantages of Cache Memory.
3. Differentiate between SRAM and DRAM.
4. Define Hit Ratio.
5. Write the functions of Handshake signals.
6. Writ the feature of DMA.
7. Write an ALP to multiply two 8-bit numbers.
8. List the addressing modes of 8085 with examples.
9. Write about different types of Stack instructions.
10. Differentiate between Serial and Parallel data transfer.

PART – B (3x18=54 Marks)

11. (a) Explain briefly about the generations of computers.
    (b) Discuss the basic operational concepts of a Computer System.
12. (a) Explain in detail about RAM chip and ROM chip with neat sketches.
    (b) Write about Secondary Memory.
13. Explain the Block diagram of 8085 with a neat sketch.
14. (a) Write in detail about 8255 in I/O mode.
    (b) Explain about A/D and D/A conversion.
15. Write an ALP to add two 16-Bit numbers.
16. Explain about 8254 (interval timer) with a neat sketch.
17. Write short notes on the following:
    (i) Virtual Memory.
    (ii) RS 232 C.

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Code No.2559/CBCS/BL

FACULTY OF ENGINEERING

B.E. (Civil) IV-Semester (CBCS) (Backlog) Examination, November 2020

Subject : Surveying - II

Time : 2 hours **Max. Marks : 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.
Assume any data missing suitably

PART – A (5x2=10 Marks)

1 Describe the basic principle of Tacheometer?
2 Define carrier waves?
3 Write the uses of Gale's Traverse table?
4 What are the conditions of closed traverse?
5 Write the bisection method of setting out of a simple circular curve?
6 State the elements of reverse curve?
7 Define sight distance along a sag vertical curve?
8 Illustrate the possible formations of sag-vertical curves based on adjacent grade lines?
9 Define stereoscopy?
10 What are the different types of photographs taken for aerial photogrammetry?

PART – B (4x15=60 Marks)

11 a) Derive an expression for determination of phase of a wave?
b) Draw a schematic diagram of Theodolite and indicate their component parts with fundamental lines?

12 a) In detail write any one the method of adjustment or balancing of closed traverse, with figure?
b) Determine the RL of Q from the following reciprocal trigonometric observations:
Angle of elevation from P to Q = 01^0 41'03"
Signal Height at Q = 3.44 m
Height of instrument at P = 1.65 m
Distance between P and Q = 17 Km
R Sin 1" = 30.96 m
RL of P = 4251.13m
Coefficient of refraction = 0.07
Assume any missing data suitably.

13 a) Describe the components of a three centered compound curve?

b) A compound curve consists of two simple circular curves of radii 360 m and 470m and the curve is to be laid out between two straights. The angle of intersection between the tangents and the two straights are 25 and 57 degrees, respectively. Calculate the various salient elements of the compound curve?

14 a) Explain any one method of settingout of vertical curve?

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b) Calculate the setting out data of a vertical curve based on the following data collected from surveying.
Proposed length of the vertical curve (L) = 290 m
A descending gradient (-gl) of 3.2% meets another ascending gradient (+g2) of 2.2%.
Chainage at the vertical point of intersection (I) = 980.00 m
RL of vertical point of intersection (I) = 150.00 m
Peg interval (PI) = 30 m

15 a) There were two point are the ground as P and Q which are vahing elevations of 610 and 445m respectively, above the MSL. The focal length of the camera is 20cm and the flying height above the MSL was 2900m. Their corresponding prohotographic coordinates are detailed below:

Corresponding Point on the Photograph	Photographic coordinates	
	X(cm)	Y (cm)
P	+2.15	+1.26
Q	-1.72	+3.15

Determine the ground coordinated and the horizontal distance between the PQ?

b) Explain the components of GIS with a sketch showing its block diagram?

16 a) Derive an expression for setting out of a simple circular curve by offsets produced from chords?

b) Write the details of different types of Total Station? Also write the uses and applications of Total Station?

17 Write short note on
a) Errors in Theodolite survey
b) Effect of curvature and refraction
c) Advantages of GIS

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Code No: 2566/CBCS/BL

FACULTY OF ENGINEERING

B.E. IV Semester (CBCS) (EEE) (Backlog) Examination, November 2020

Subject: Power System-I

Time:2 Hours **Max .Marks:70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1. Define mass curve.
2. Discuss the importance of diversity of loads in power system.
3. What is surge tank? Explain.
4. Define the terms thermal efficiency and overall efficiency of steam power station.
5. What are the non-conventional sources?
6. Draw the schematic diagram of a solar power plant.
7. Name the various materials that are used for overhead line insulators. Why glass insulator cannot be used above 50KV?
8. List the various parts of cables.
9. What do you understand by transposition in overhead lines? Explain why transposition is done in such line.
10. Explain the terms skin effect and proximity effect.

PART – B (4x15=60 Marks)

11. a) Explain the function of Economizers and super heaters.
    b) Draw the schematic diagram of a modern Hydro power plant and explain it's major parts.

12. a) Explain the working principle of nuclear power generation with neat diagram.
    b) Discuss the function of basic components of wind energy conversion plant.

13. a) Explain the different types of tariffs.
    b) Explain depreciation by sinking fund method.

14. A 1.5 Km long single phase 2-wire feeder supplies the loads as under.
    60A at 0.8 pf. (lagging), 600m from the feed point
    40A at 0.85 pf (lagging), 1200m from the feed point
    50A at 0.88pf (lagging), 1500m from the feed point
    The resistance and reactance of the feeder per Km length(go and return) are 0.12 ohms and 0.2 Ω respectively. If the voltage at the far end is to be maintained at 220V, calculate the voltage of the sending end and its phase angle with respect to the receiving end voltage.

15. a) Explain capacitance grading of a cable.
    b) Derive the expression for sag of a line supported between two supports of the same height.

16. a) Discuss the methods for improving the string efficiency of overhead line insulators.
    b) What are the factors governing the capacitance of a transmission line? Derive the expression for the capacitance of an unsymmetrical transposed 3-phase transmission line.

17. Derive an expression for the insulator per phase for a 3-phase overhead transmission line when

i) Conductors are symmetrically placed
ii) Conductorare unsymmetrically placed but the line is completely transposed.

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Code No.2569/CBCS/BL

FACULTY OF ENGINEERING

B. E. IV– Semester (CBCS) (Inst.) (Backlog) Examination, November 2020

Subject: Transducer Engineering

Time: 2 hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1. Define Calibration and drift.
2. Explain the term hysteresis.
3. What are the desirable characteristics of Strain gauge?
4. Define gauge factor.
5. Explain the principle of rotary variable differential transformer.
6. What are the disadvantages of LVDT?
7. What is Seebeck effect?
8. Explain law of intermediate metal.
9. Explain bellows in brief.
10. Compare flat type and corrugated type diaphragm.

PART – B (4 x 15 = 60 Marks)

11. Derive an equation for step response of the first order system.

12. a) What is Gauge factor? Derive the expression for gauge factor of a strain gauge(8)
    b) A platinum thermometer has a resistance of 100Ω at 25˚C. Find its resistance at 65˚C.

13. Explain Ionization gauge in detail with neat diagram, Write its advantages and disadvantages.

14. a) Explain capacitive proximity transducer.
    b) Explain aluminium oxide hygrometer in detail.

15. a) Explain bimetallic thermometer.
    b) With schematic explain vapour pressure thermometer.

16. a) Discuss various elastic elements for pressure measurement.
    b) Explain in detail semiconductor strain gauge.

17. Write short notes on
    a) Dead weight gauge.
    b) Unbonded strain gauge.

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Code No: 2575/CBCS/BL

FACULTY OF ENGINEERING

BE IV Semester (CBCS) (ECE) Examination, November 2020

Subject: Probability Theory & Stochastic Process

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1) If A⊂ B, P(A) = 1 / 4 and P(B) = 1 / 3, find P(A/B) and P(B/A).
2) Define a random variable. State the conditions for a function to be a random variable.
3) Show that the area under the exponential distribution curve is 1.
4) State the properties of characteristic function.
5) Write the properties of joint distribution function.
6) If X_1, X_2 and X_3 are the three independent random variables with mean values 3, 6 and -2 respectively, find the mean value of $g(X_1,X_2,X_3)= -2X_1X_2-3X_1X_3+4X_2X_3$.
7) Differentiate strict sense stationary and wide sense stationary process.
8) Define Gaussian random process.
9) Show that power spectral density (PSD) is even function of frequency.
10) Find the PSD of a stationary process X whose Auto Co relation Function is a $e^{-b|\tau|}$ where a and b are constants.

PART – B (4x15=60 Marks)

11. a) State and prove Baye's Theorem.
    b) Players X and Y roll a pair of dice alternately. The player, who rolls 9 first, wins the game. If X starts, what is the probability that he wins the game?

12. a) A fair coin is tossed twice. If X denote the number of heads, calculate the variance of the random variable X.
    b) Find the moment generating function of a random variable having density function $f_X(x) = e^{-x}$, $x \geq 0$ Also find the first two moments about the origin.

13. If two random variables $X_1$and X_2 are jointly Gaussian, then prove that they are individually Gaussian.

14.a) Show that the random process X(t) = A Cos (wt + θ) is wide sense stationary where A and w are constants and θ is uniformly distributed random variable in the interval (0, 2π).
    b) Discuss first order, second order and N^{th} order stationary processes.

15. a) The input to a low pass RC filter is a white noise process. Determine the power spectral density and ACF of the output process Y(t).
    b) Find the Autocorrelation function of the random process for which the Power spectral density is $5 x (\omega) = 2 / \{ 1+ (\omega/\alpha)^2\}$

16. a) If the random variable X is uniform in the interval (-2 , 2), find the mean and variance of X.
    b) State and explain Central Limit Theorem.

17. a) Three machines A, B and C produce respectively 60%, 30% and 10% of the total number of items of a factory. The percentage of defective outputs of these machines is 2%, 3% and 4% respectively. An item is selected at random and is found to be defective. Find the probability that the item was produced by machine C.
    b) Write short notes on different types of noises.

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Code No. 2579/CBCS/BL

FACULTY OF ENGINEERING

B.E IV-Semester (CBCS) (Mech) (Main & Backlog) Examination, November 2020

Subject: Applied Thermodynamics

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1. Why inter cooling is employed in multistage reciprocating air compressors?
2. Mention important differences between single-acting and double-acting reciprocating air compressors.
3. Define (i) BSFC and (ii) ISFC as applied to an Internal Combustion Engine. What is their significance?
4. Write the formula of indicated power and explain each term.
5. Compare knocking phenomena in S.I. and C.I. engines. With neat Diagram
6. Define equivalent ratio.
7. Mention the functions of (i) Fusible plug, and (ii) Pressure gauge as referred to steam boilers.
8. Define condenser and explain any one type of jet condenser. With neat Diagram
9. What is the utility of economizer used in power plant?
10. What type of nozzle is used for compressible fluids and why?

PART- B (4x15=60 Marks)

11. A two stage, single acting, reciprocating air compressor takes in air at 1 bar and 300^0K. The delivery pressure is 10 bar. The law of compression is $PV^{1.3}$ = constant. The rate of discharge is 0.1 kg/s. Calculate (a) power required to drive the compressor (b) Saving in work in comparison with single stage compression (c) Isothermal efficiency and (d) Heat transfer to intercooler. Take R_{air} = 287 J/kg^{0}K.

12.a) A 6-cylinder, 4-stroke Diesel engine has a cylinder bore of 120 mm and a stroke of 150 mm. It develops a brake output of 95 kW, while it runs at 2000 Rpm. It consumes 27.3 liters of Diesel fuel per hour. The fuel specific gravity is 0.83. The frictional loss is estimated to be 25 kW at the above speed. Calculate (i) BMEP, (ii) IMEP, (iii) Mechanical Efficiency (iv) BSFC and ISFC and (v) Torque for the above engine.

b) Discuss the merits of battery ignition system over magneto ignition system in S.I. engines?

13.a) Briefly explain the stages of combustion in S.I. engines with the help of pressure v/s crank angle diagram. Mention the factors influencing flame speed.

b) Discuss briefly about the types of combustion chambers used in SI engines.

14. a) Explain the working principle of stirling boiler with a neat sketch.
b) Explain the working principle of a cooling tower, and mention their types..

15.a) Define the term critical pressure. Derive an expression for condition for maximum discharge.

b) In a convergent-divergent nozzle the steam enters at 15 bar, 300^0C and leaves it at a pressure of 2 bar. The inlet velocity to the nozzle is 150m/sec. Find the required throat and exit areas for mass flow rate of 1kg/sec. Assume, nozzle efficiency to be 90%. Assume C_p = 2.4 Kj/kg k

16. Write short notes on the following :
a) Polytrophic, Isothermal& Isentropic efficiencies in Reciprocating Air Compressors.
b) Combustion phenomena in C.I. engine.

17. Write short notes on
a) How is scavenging period determined from valve timing diagram?
b) Equivalent Ratio.
c) After-cooler.

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Code No: 2582/CBCS/BL

FACULTY OF ENGINEERING

BE IV-Semester (CBCS) (PROD) (Backlog) Examination, November 2020

Subject : Applied Thermodynamics and Heat Transfer

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1. For a reciprocating air compressor , what is meant by Free Air Delivered ? BT2,CO1
2. For a two stage reciprocating air compressor, without clearance, draw indicator diagram diagram with intercooling and label the parts ? BT1,CO1
3. Mention the applications of IC engines ? BT2,CO2
4. Define Brake Specific Fuel Consumption ? What does it signify ? BT3,CO2
5. What is meant by critical insulation ? BT2,CO4
6. Distinguish between convective heat transfer coefficient and overall heat transfer coefficient ? BT2,CO4
7. What is convective resistance ? Write expression for it ? BT2,CO4
8. Write Stefan Boltzmann law of radiation ? BT1,CO5
9. What are the ill effects of knocking in IC engines ? BT2,CO3
10. Graphically show the temperature distribution in parallel flow heat exchanger ? Write expression for LMTD ? BT2,CO6

PART – B (4x15=60 Marks)

11. For a 2 stage reciprocating air compressor, derive an expression for work done per cycle. Assume perfect inter cooling and zero clearance.
    The compression is isentropic. BT2 ,CO1

12. In an experimental trial (morse test) on S.I engine, the following observations are made. The engine has 4 cylinders.
    BP when all cylinders are working:15.6KW
    BP when first cylinder is cut off :11.1KW
    BP when second cylinder is cut off :11.0KW
    BP when third cylinder is cut off : 10.9KW
    BP when fourth cylinder is cut off :10.7KW
    Determine the IP of the engine and mechanical efficiency. BT2,CO2

13. Compare 2 stroke engines with 4 stroke engines in detail. BT4, CO2

14. a. Explain the necessity of cooling system in I.C engine with neat sketch.
    b. Explain Forced circulation cooling system. BT2,CO3

15. Explain forced convection heat transfer with example.
    Write Buckingham pi theorem.
    Define Reynolds number, Nusselt number and Prandntl number. BT2,CO4

16. Explain (a) Planck's law of radiation
    (b) Kirchhoff's law
    (c) wein's displacement law BT1,CO4

17. A composite wall is made of two different materials A and B. The thickness of the layers are 8mm and 6 mm respectively. The respective thermal conductivities are 50W/m◦c and 80W/m◦c. The temperatures of end faces of the composite wall are 200◦c and 40°C. Determine the rate of heat transfer through the composite wall per sq mt area and interface temperature. BT3,CO4

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Code No. 2585/CBCS/BL

FACULTY OF ENGINEERING

B.E. IV - Semester (CBCS) (A.E.) (Backlog) Examination, November 2020

Subject : Metallurgy and Material Testing

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1. What are various types of point defects?
2. Define the term “Fracture”. List various types of fracture.
3. Define “Fatigue” List the factors effecting fatigue.
4. State and explain FICK’S Ist LAW of diffusion.
5. What are the applications of phase diagram?
6. How plain carbon steels are classified?
7. What are the differences between hardening and tempering?
8. Explain full annealing process.
9. Write the applications of Eddy Current test.
10. Write the differences between Charpy and Izod tests.

PART – B (4x15=60 Marks)

11 a. Explain the influence of recovery and recrystallisation and grain growth on mechanical properties

b. What are the metallurgical advantages of hot working over cold working?

12 a. Explain the experimental determination of fatigue strength with the help of the neat sketch.

b. Differentiate between creep curve and stress rupture curve.

13 a. Draw Iron – Iron carbide diagram and label all points, lines and areas.

b. How Cast irons are classified? Explain the characteristics of cast irons.

14 a. What are the different stages of tempering? Discuss in detail.

b. What is surface hardening? Explain the process of flame hardening treatment.

15 a. With neat sketches explain the steps involved in conducting Liquid penetrant inspection.

b. Describe briefly the application of composite, ceramic and polymeric materials in automobiles.

16 a. Explain the mechanism of plastic deformation by slip.

b. Draw and explain the cooling curves for i) pure metal and ii) Solid solution.

17. Write short notes on:

a. Low cycle fatigue.

b. Age Hardening.

c. Magnetic Particle Test.

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Code No: 2589/CBCS/BL

FACULTY OF ENGINEERING

BE IV Semester (CBCS) (CSE) (Backlog) Examination, November 2020

Subject: OOP Using Java

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1 Explain the working of short-circuit logical operators in Java.
2 What is an inner class? How can you create inner class object outside its enclosing class.
3 List the character stream classes.
4 What is the difference between comparing two strings using == operator and equals( ) method?
5 List and explain the constructors of String Tokenizer class.
6 Write a Java program to reverse the contents of a given list.
7 What is the use of Check box Group class? Give an example.
8 Define Layout manager? List the different layout managers in Java.
9 What is serialization? Which type of objects can be serialized?
10 Mention advantages of Swings over AWT.

PART – B (4 x 15 = 60 Marks)

11 a) What are the various object oriented concepts? Discuss.
b) Explain the concept of inheritance and give an example of multilevel inheritance.

12 Illustrate how inter-thread communication is achieved in Java with the help of an example.

13 a) Write a Java program to create a list that contains only the common elements in the given two lists.
b) Explain the use of Map.Entry interface with the help of an example.

14 a) Explain about event classes and event listeners interfaces.
b) Explain the steps involved in creating and handling menus.

15 a) Write a Java program to merge the contents of two files into another file.
b) Write a Java program to load and display an image.

16 a) Write about access specifiers in Java.
b) Explain multi-catch feature in exception handling? Give an example.

17 Write short notes on any **TWO** of the following
a) Hashtable
b) Dialog Boxes
c) Object class

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Code No: 2595/CBCS/BL

FACULTY OF INFORMATICS

BE IV Semester (CBCS)(I.T) (Backlog) Examination, November 2020

Subject: OOP Using JAVA

Time: 2 Hours **Max. Marks: 70**

Note: Answer any five questions from Part-A. Answer any four questions from Part-B.

PART – A (5x2=10 Marks)

1. Write the difference between method overloading and method overriding?
2. What is variable and write about types of variables?
3. Explain about inheritance? What are the types of inheritance supported in java?
4. List uses of super keyword?
5. What is the difference between throw and throws?
6. Explain life cycle of a thread?
7. What is the difference between Array List and vector?
8. Draw the hierarchy of collection interface?
9. Write the difference between swings and awt?
10. Explain about menu components?

PART – B (4 x 15 = 60 Marks)

11. (a) Explain Java buzzwords in detail?
    (b) What are inner classes?

12. (a) Difference between abstract classes and interfaces with examples?
    (b) Write about Access modifiers in java?

13. (a) Explain the concept of synchronization with example?
    (b) How many types of exceptions in Java and what are they explain with suitable examples?

14. (a) Write a program for copying the image using files?
    (b) Explain serialization concept with the example?

15. (a) Explain about adapter classes?
    (b) Discuss any five methods in String class with an example?

16. (a) Explain about delegation event model?
    (b) How do you pass parameters to an applet?

17. Write short notes on the following:
    (a) Buffered Reader and Buffered Writer
    (b) Iterator versus List Iterator.

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