FACULTY OF ENGINEERING
B.E. (Civil) V Semester (CBCS) (Backlog) Examination, March / April 2022
Subject: Reinforced Cement Concrete

Time: 3 Hours   Max. Marks: 70

(Missing data, if any, may be suitably assumed)
PART – A
Note: Answer all questions.   **(10 x 2 = 20 Marks)**

1. Define characteristic strength and characteristic load.
2. What are the limiting values of depth of neutral axes for different grades of steel?
3. Explain the acceptability criteria for deflections.
4. Draw neat sketch showing stress block of concrete as per limit state design.
5. Give any two assumptions made in limit state method.
6. Draw yield line pattern for a rectangular slab fixed at all edges.
7. How do you arrive minimum eccentricity in the design of columns?
8. Differentiate between one way slab and two-way slab.
9. Sketch critical section of two-way shear in footings.
10. What are the IS specifications required for the design of isolated footings?

PART – B
Note: Answer any five questions.   **(5 x 10 = 50 Marks)**

11. (a) Explain the limitations of working stress method and limit state method.
    (b) Explain under reinforced, balanced and over reinforced section.

12. Using working stress method, determine the moment of resistance of a beam 250 mm wide and 460 mm deep, reinforced with 4 bars of 20mm diameter. Use M-25 grade concrete and Fe-415 steel.

13. Determine the ultimate moment of resistance of a beam section with overall dimension 300 mm x 400 mm, reinforced with 3 bars of 20 mm diameter in compression and 3 bars of 25 mm diameter in tension side with a clear cover of 30 mm. Adopt M-20 concrete and Fe-415 steel.

14. Design the reinforcement in a beam 300 mm x 500 mm overall dimensions, subjected to a factored bending moment of M_u=100 kN-m, factored shear of 75 kN and factored twisting moment of T_u=15 kN-m. Assume an effective cover of 35 mm alround, and adopt M-20 concrete and Fe-415 steel.

15. Design a slab for a room 6.5mx7.5m clear in size to support a superimposed service load of 6kN/m2 if two of its adjacent edges are continuous and other two are discontinuous. Assume if any data required.

16. A square RCC column 400mm x 400mm carries a working load of 650 kN axially. Design a square footing if SBC of soil is 225 kN/m^2. Use M-25 grade concrete and Fe-500 grade steel. Use limit state method.

17. Design a footing for a 550mm square column reinforced with 8-25 mm diameter Fe-550 grade bars and M-25 grade concrete, one side of the footing is restricted to 1.5m the gross bearing capacity of the soil is 120 kN/m^2. Assume concrete as M-25 and grade of steel as Fe-500.

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FACULTY OF ENGINEEERING

B.E. (EEE) V Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Power System - II

Time: 3 Hours   Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: **Answer all questions**.   **(10 x 2 = 20 Marks)**

1. For a medium length nominal T transmission line draw the phasor diagram for lagging power factor conditions.

2. What is the importance of generalized circuit constants of a transmission lines.

3. Explain the switching sequence for on-load tap changing transformer.

4. Four identical alternators each rated for 20 MVA, 11KV having a sub transient reactance of 16% are working in parallel. Find the short circuit level at the bus bars.

5. What is the need for the base values?

6. Draw the vector diagram with the help of sequence components to obtain the phase voltages.

7. Draw the connections of sequence networks for three phase to ground fault through and impedance Zr.

8. What is the importance of voltage control in power systems?

9. What is travelling wave? Explain the development of such wave in transmission line.

10. Give reason why a traveling wave suffers reflection when it reaches a discontinuity?

PART - B

Note: Answer any five questions.   **(5 x 10 = 50 Marks)**

11 a) Derive A, B, C, D Parameters of a long Transmission lines.
   b) What is Corona and explain the factors affecting corona.

12 a) Explain the method of determining of Negative Sequence Reactance of an alternator.
   b) From fundamentals along with the necessary diagrams obtain the expressions for fault currents for unloaded synchronous generator for the following types of faults. (Assume the neutral is grounded through an impedance Zn.) (i) Single line to ground fault (ii) Line to Line fault.

13 a) Obtain the formula for fault current in case of L-L-C Fault in 3 phase abc phase sequence power system.
   b) Three 10MVA, 6.6KV, 3-phase star-connected alternators are operating in parallel. Each has X_{d11} = 15%, X_2 = 12% and X_o = 4.5%. If an earth fault occurs on one bus bar, determine the faults current when all the three alternators are solidly grounded.

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14 Along with its advantages and disadvantages explain the following
   (with necessary diagrams)
   a) Series and shunt capacitors
   b) Booster transformer
   c) Thyristor controller reactor

15 a) Write short notes on Bewely lattic diagram
   b) A travelling wave of 50kV enters an overhead line of surge impedance 400 ohms
      and conductor resistance 6 ohm per km. Determine (i) the value of the voltage wave
      when it has travelled through a distance of 50km. and (ii) the power loss and the
      heat loss of the wave during the time required to travel this distance. Neglect the
      losses in the insulation and assume a wave velocity of 3 x 105km per second.
      Determine the corresponding values for a cable having surge impedance of 40
      ohms and relative permittivity 4.

16 a) Explain the operation of synchronous phase modifier
   b) Explain the development of a travelling wave on an overhead line?

17 A 50 Hz. Three-phase, 275kY, 400km transmission line has her following parameters:
   Resistance = 0.035 ohms / km per phase, Inductance = 1.1mH/km per phase,
   Capacitance = 0.012pF/km per phase. If the line is supplied at 275kV, determine the
   MVA rating of a shunt reactor having negligible losses that would be required to
   maintain 275kV at the receiving – end when the line is delivering no load. Use nominal
   Πmethod. Draw the circle diagram.

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FACULTY OF ENGINEERING
B.E. (INST.) V Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Power Plant Instrumentation

Time: 3 Hours   Max. Marks: 70

(Missing data, if any, may be suitably assumed)
PART – A
Note: Answer all questions.   **(10 x 2 = 20 Marks)**

1. List out the important functions of Steam Circuits.
2. What do you mean by Shaft vibration measurement?
3. What is the significance of Air- Fuel ratio?
4. Draw the Schematic of Solar power generation?
5. What do you mean by combined cycle power plant?
6. List out the various piping system for pressure measuring devices.
7. Why cooling of a generator is required in power generation?
8. What is the importance of control rods in NPP?
9. What is meant by Attemperation and Burning tilting up in Combustion control?
10. Mention the different types of Draught?

PART – B
Note: Answer any five questions.   **(5 x10 = 50 Marks)**

11. (a) Outline the importance of instrumentation in power generation?
    (b) With a neat diagram, Explain P & I diagram of boiler?

12. (a) With a neat diagram, explain in detail the flame monitoring system?
    (b) Explain in detail any two non- contact type of transducer for speed measurement?

13. (a) Explain in detail about steam temperature control with relevant figures?
    (b) With relevant process diagram, explain the three element drum level control of boiler in power plant?

14. (a) With a neat diagram, Explain about Condenser Vacuum control?
    (b) Explain in detail the working of Lubricating oil temperature controller with relevant figures?

15. What is the function of Nuclear reactor in NPP? Explain the working principle of NPP with relevant diagram?

16. (a) What is meant by TSI? Explain?
    (b) Explain in detail the Layout of Hydro Electric Power plant?

17. Write Short notes on;
    (a) De-aerator
    (b) LVDT
    (c) Feed Water Conditioning

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FACULTY OF ENGINEERING
B.E. (ECE) V - Semester (CBCS) (Backlog) Examination, March / April 2022
Subject: Linear ICs and Applications

Time: 3 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: **Answer all questions**.   **(10 x 2 = 20 Marks)**

1. Define CMRR and explain the significance of a relatively large value of CMRR
2. Explain why open loop configuration of op amp are not used in linear applications
3. What are the limitations of an ideal differentiator? How they can be overcome?
4. Design an inverting amplifier using op-amp with the gain of -15.
5. What is meant by all-pass filter? Draw the circuit of it.
6. Design a wide band pass filter having f_H = 2000 Hz, f_L = 100 Hz with pass band gain of 4.
7. With neat functional block diagram explain the operation of IC 565.
8. Briefly explain the role of low-pass filter and VCO in PLL. Also define the terms lock in range &capture range.
9. Define following for ADC 1. Conversion time 2. Percentage resolution.
10. Find the step size and analog output for 4-bit R-2R ladder DAC when the input is 1000 and 1111. Assume V_{ref} = +5 V.

PART - B

Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11. (a) Draw the circuit diagram of a dual input unbalanced output differential amplifier configuration and perform the DC and AC analysis.
   (b) Compare ideal and practical op-amp parameters.

12. (a) Draw the circuit of anti-logarithmic amplifier and derive the expression for output voltage. Also mention some of its applications.
   (b) Design a circuit using an Op-amp to generate a output $V_o = - (0.2V_1 + 10 V_2 + V_3)$, where V_1, V_2, V_3 are input Voltages.

13. (a) Draw and explain the second order low pass Butterworth active filter and also derive its voltage gain equation.
   (b) Explain the significance of precision rectifier.

14. (a) Draw the circuit of Schmitt trigger using op-amp and explain its operation.
   (b) Draw op-amp based current to voltage converter and show that $V_o \alpha$ I

15. Explain the operation of monostable multi-vibrator using 555 timer. Derive the expression for its time delay.

16. (a) Explain the working of successive approximation type converter and compare the conversion times of tracking and successive approximation type ADCs
   (b) Which is the fastest ADC and explain the reason?

17. Write short notes on the following.
   (a) Sample and hold circuit   (b) R-2R ladder type D/A converter

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FACULTY OF ENGINEERING
B.E. (M/P/AE) V Semester (CBCS) (Backlog) Examinations, March / April 2022

Subject: Dynamics of Machines

Time: 3 Hours   Max. Marks: 70

(Missing data, if any, may be suitably assumed.)

PART – A

Note: Answer all questions   **(10 x 2 = 20 Marks)**

1   Explain the terms Piston effort and Crank effort?
2   What is controlling force? What is the use of controlling force diagram?
3   Explain the functions of Flywheel in I.C engine and in a punching macine?
4   Define stability and isochronism and hunting in governors.
5   Differentiate between governor and flywheel?
6   Explain how multi-cylinder engines are balanced.
7   Explain the terms 'static balancing' and 'dynamic balancing'. State the necessary conditions to achieve them?
8   Explain why partial balancing of reciprocating masses is done instead of complete balancing.
9   Define the terms magnification factor, Vibration Isolation, Transmissibility, Damping Factor and Logarithmic decrement.
10 Explain the method of determination of natural frequency of geared system.

PART – B

Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11   The ratio of connecting rod length to crank length of a vertical gasoline engine is 4. The engine bore and stroke is 8 cm and 10 cm respectively. The mass of reciprocating parts is 1 kg. The gas pressure on the piston is 6 bar. When it has moved 40^0 from the inner dead centre on its power stroke. Determine: Net load on piston; Net load on gudgeon pin and the crank pin; Thrust on cylinder walls; Thrust on crank bearings. The engine runs at 2000 rpm. At what engine speed will this load on gudgeon pin at the crank pin be zero?

12   For Hartnell type governor the following data apply:
Mass of each of the fly balls = 1.5 kg; Sleeve arm = 50 mm; Ball arm=100 mm; Distance from fulcrum to governor axis = 80 mm; Minimum radius of governor = 70 mm; Maximum radius of governor = 90 mm; Minimum equilibrium speed = 500 r.p.m. the maximum equilibrium speed I s5% higher than the minimum equilibrium speed.
Determine:
(i) the spring rate
(ii) the equilibrium speed when radius of rotation of the ball is 85 mm. Neglect the obliquity of the arms and effects due to friction.

13   A punching press is required to punch 30 mm diameter holes in a plate of 20 mm thickness at the rate of 20 holes per minute. It required 6 N-m of energy per mm^2 of sheared area. If punching takes place $1/10^{th}$ of a second and the speed of the flywheel varies from 160 to 140 rpm, determine the mass of the flywheel having radius of gyration of 1m.

14   The three cranks of a three cylinder locomotive are all on the same axle and are set at 120^0. The pitch of the cylinders is 1 m and the stroke of each piston is 0.6m. The reciprocating masses are 300 kg for inside cylinder and 260 kg for each outside cylinder and the planes of rotation parts are to be balanced, find:
      (i) The magnitude and the position of the balancing masses required at a
          radius of 0.6m; and
      (ii) the hammer blow per wheel when the acle makes 6 r.p.s

15   Determine the natural frequency of torsional vibrations of a shaft with two circular discs of uniform thickness at the ends. The masses of the discs are $M_1=500$ kg; $M_2=1000$ kg; and their outer diameters are $D_1=125$ cm; $D_2=190$ cm; The length of the shaft is 300 cm. The shaft having diameter 10 cm upto 100 cm length and 20 cm diameter for the rest of the length. Modulus of rigidity for the material of the shaft is $G=0.83 \times 10^4$ N/m^2. Find the natural frequency.

16 a) A vertical steel shaft 15 mm diameter is held in long bearings 1 m apart and carries at its middle a disc of mass 15 kg. The eccentricity of the centre of gravity of the disc from the centre of the rotor is 0.30 mm. The modulus of elasticity for the shaft aterial is 200 GN/m^2. Determine the critical speed of the shaft.
   b) A vibrating system consists of a mass of 20 kg, a spring of stiffness 20 KN/m and a damper. The damping provided is only 30% of the critical value. Determine the natural frequency of the damped vibration and the ratio of two consecutive amplitudes.

17   Write a short notes on the following:
      a) Gyroscopic effects in vehicles
      b) Direct and Reverse Crank Method
      c) Explain the Dunkerley's method for finding natural frequency of multi rotor
         system.
      d) Write a short note about modes of vibration in a torsional vibration.

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FACULTY OF ENGINEERING
B.E. (CSE) V - Semester (CBCS) (BACKLOG) Examination, March / April 2022

Subject: Database Management System

Time: 3 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions.   **(10x2 = 20 Marks)**

1   What is the need of data model in DBMS and give its classification?
2   Discuss Entity-Relationship design issues in brief.
3   What is a surrogate key? How can it be used for schema refinement?
4   Discuss about group by clause and having clause.
5   Explain object-oriented data model.
6   Define Trigger. Write syntax of Trigger.
7   Write about multiple granularity.
8   What is the difference between primary and secondary index?
9   What is fuzzy check point?
10 Define recoverability.

PART – B

Note: Answer any five questions.   **(5x10 = 50 Marks)**

11 (a) Explain the differences between File Processing System and DBMS.
   (b) Explain Database design for Banking Enterprise using E-R diagram.

12 (a) Consider the following schema:
       Suppliers (sid, sname, address)
       Parts (pid, pname, color)
       Catalog (sid, pid, cost)
       Write the relational algebraic queries for the folloiwng:
       (i)   Find the sids of suppliers who supply some red or green part
       (ii)   Find the sids of suppliers who supply every red or green part
       (iii)   Find the pids of parts supplied by at least two different suppliers.
   (b) Explain about Nested sub queries with example.

13 (a) Write Dynamic SQL program to retrieve data from data base.
   (b) Discuss features of Good Relational Design.

14 Compare static and dynamic hashing show the extendable hash structure for the
   search key values 2,3,5,7,11,17, 19, 23,29,31 where h(x)=x mod 8 and buckets can
   hold 3 records.

15 (a) What is concurrent control? Explain Lock based protocols.
   (b) Explain ARIES algorithm in detail.

16 (a) Write about weak levels of consistency with example.
   (b) Explain about restart recovery.

17 Write short notes on:
   (a) Storage Structure
   (b) Thomas write Rule
   (c) Recursive Queries.   ****

FACULTY OF ENGINEERING
B.E. (IT) V - Semester (CBCS) (Backlog) Examination, March / April 2022

Subject: Software Engineering

Time: 3 Hours   Max. Marks: 70
(Missing data, if any may be suitably assumed)

PART – A
Note: Answer all questions.   (10x2 = 20 Marks)

1 Brief about CMM Process Patterns.
2 Differentiate TSP and PSP.
3 Define functional independence and How can you assess functional independence.
4 What are the various modeling approaches in analysis model?
5 Write short notes on pattern based software design.
6 Write about basic behavioral modeling.
7 What are the rules of UML?
8 Define cyclomatic complexity.
9 List goals of SQA.
10 Define Abstraction and Refinement.

PART – B
Note: Answer any five questions.   (5x10 = 50 Marks)

11 (a) Explain about specialized Process models.
   (b) Define unified process and explain it in detail.

12 Define agile software process. Thereby explain Scrum & Extreme Programming.

13 (a) Explain various architectural styles and Patterns.
   (b) Write short notes on flow oriented modeling.

14 (a) What are the things in UML? And explain in detail.
   (b) Explain the relationships in UML.

15 (a) Explain test strategies for o-o software.
   (b) Brief about Basis Path testing.

16 Explain various software testing strategies in detail.

17 Write notes on:
   (a) ISO 9000 standards
   (b) Six sigma.

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FACULTY OF ENGINEERING
B.E. (CIVIL) V Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Structural Analysis - I

Time: 3 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)
PART – A
Note: Answer all questions.   **(10 x 2 = 20 Marks)**

1 Differentiate between statically determinate and indeterminate beams,
2 Write a note on the relative merits and demerits of statically indeterminate beams over determinate beams.
3 What is sinking of supports? What is effect on the end moments of the member?
4 Analyze the propped cantilever beam and draw shear force and bending moment diagrams.
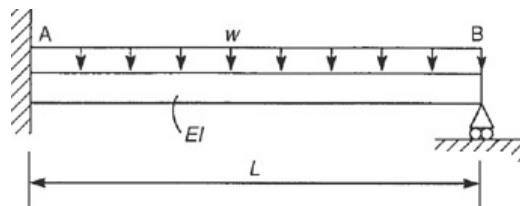
5 What is the length of the substitute column to the original column when the columns have hinged bases in Kani's method?
6 Explain briefly what do you understand by an arch?
7 Name the analytical methods to determine the horizontal thrust in a two hinged arch.
8 Where are trussed beams used in practice?
9 Sketch the cable stayed bridge and mark the various components of it.
10 Draw the influence line diagrams for shear force and bending moment at a point C for a simply supported beam AB.

PART – B
Note: Answer any five questions.   **(5 x 10 = 50 Marks)**

11 A continuous beam ABC is simply supported at A and C and continuous over support B with AB = 5m and BC = 6m. A uniformly distributed load of 12kN/m is acting over the beam. The moment of inertia is I throughout the span. Analyse the continuous beam and draw S.F.D and B.M.D.

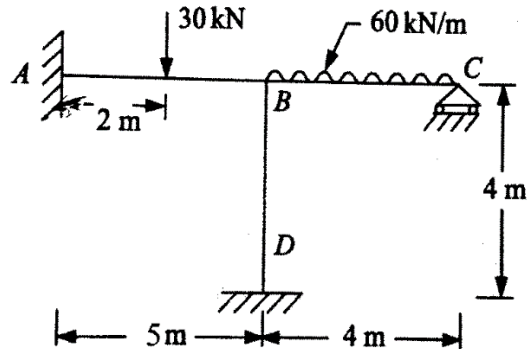12 Draw BMD for the beam by using moment distribution method.
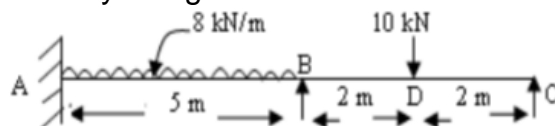
13 Analyze the given frame using Kani's method.
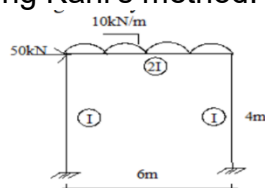
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14 A Pratt truss has 6 panels of 5m each and height of 4m. Draw the ILD's of bottom chord, top chord and inclined member of third panel from left to right.

15 Analyse the frame shown in figure using slope deflection method. Also draw BMD.

16 A suspension bridge of 120 m span has two girders supported by two cables having a central dip of 12 m. The road way has a width of 6 m. The dead load on the bridge is 5kN/m^2 while the live load is 10 kN/m^2 which acts on the left half of the span. Determine the shear force and bending moment in the girder at 30 m from the left end. Find also the maximum tension in the cable for the position of live load.

17 (a) State the position of a uniformly distributed load for a maximum bending moment and shear force when it crosses girder of smaller than that of load.

(b) A three hinged stiffened girder (ACB) of suspension bridge span 120m subjected to two-point loads 240kN and 340kN as shown in fig. Find Bending moment at 40m from left end. Assume supporting cable has central dip 12m. Find the maximum tension in the cable and draw bending moment diagram for the girder.

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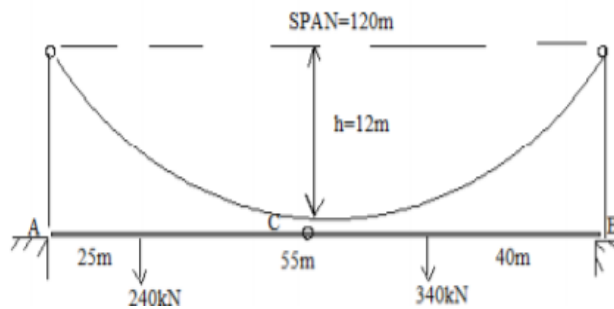
FACULTY OF ENGINEERING
B.E. (EEE) V – Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Electrical Machines - II

Time: 3 Hours   Max. Marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: **Answer all questions**.   **(10 x 2 = 20 Marks)**

1. Define slip speed and per unit slip

2. Explain the effect of increasing the rotor resistance on starting torque and maximum torque.

3. Induction motor draws high current at starting Justify.

4. Pole changing method cannot be used for slip ring induction motor, Justify.

5. Compare salient pole and cylindrical rotor alternators.

6. Predetermination of regulation using Synchronous impedance method is called pessimistic method. Explain.

7. Compare induction motor and synchronous motor in any 4 aspects.

8. List the reasons for hunting

9. A DC series motor when connected to AC supply produces unidirectional torque. Justify.

10. List the applications of BLDC motor

PART – B

Note: **Answer any five questions**.   **(5 x 10 = 50 Marks)**

11. a) Develop the equivalent circuit of an induction motor and show the representation of mechanical load in terms of electrical parameter.
    b) The rotor emf of a 3-phase, 4 pole, 50 Hz induction motor makes 120 complete oscillations per minute. Find (i) synchronous speed (ii) Per unit slip (iii) Speed of induction motor.

12. a) Explain the various speed control methods of induction motor.
    b) Explain cogging and crawling effects in an induction motor.

13. a) A3 phase, 50 Hz star connected alternator is rated at 1600 kVA, 13.5kV. It has synchronous impedance of 1.5+j30Ω per phase. Solve for regulation at full load and 0.8 pf leading.
    b) Explain two reaction theory develop the relation between excitation emf and terminal voltage for a salient pole synchronous generator.

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14 a) Define synchronizing power and synchronizing torque.
   b) A 2200 V, 400 kW 3-phase star connected synchronous motor has synchronous impedance of $1+j10\Omega$ per phase. Determine the excitation emf and load angle if the motor works at rated load at 0.8pf leading with an efficiency of 94%.

15 a) Explain the construction and principle of operation of ac series motor.
   b) Illustrate the construction and principle of operation of SRM.

16 a) Explain the construction and principle of operation of double cage induction motor.
   b) Explain the methods of synchronizing two alternators.

17 a) A salient pole synchronous generator with negligible resistance has $X_d = 0.8$ p.u and $X_q = 0.5$ p.u. If the generator is supplying rated kVA at rated voltage and at 0.8 p.f lagging solve for the excitation emf and load angle.
   b) Explain the principle of operation of capacitor start single phase induction motor and list its applications.

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FACULTY OF ENGINEERING
B.E. (EIE) V Semester (AICTE) (Main&Backlog) Examination, March / April 2022

Subject: Instrumentation Systems

Time: 3 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A
Note: Answer all questions.   **(10 x 2 = 20 Marks)**

1 Why angular velocity measurement method is preferred to measure linear velocity?
2 Define Strobotron.
3 Enlist types of dynamometer.
4 Describe radiation thermometer.
5 Define critical velocity.
6 Define turbulent flow.
7 What is the principle of ultrasonic method for measurement of liquid level?
8 Define absolute humidity.
9 Define PWL.
10 Two machines of equal SPL of 85dB are switched ON simultaneously. What is the resultant SPL?

PART – B
Note: Answer any five questions.   **(5 x 10 = 50 Marks)**

11 (a) Explain electromagnetic velocity transducer.
     (b) Differentiate between DC and AC tachogenerator.

12 (a) Explain vapour pressure thermometer in detail.
     (b) Explain laws of thermocouple in detail.

13 (a) Explain in detail Rotameter with neat diagram.
     (b) Write advantages and disadvantages of Head type flow meter.

14 (a) Write a short note on anemometer.
     (b) Explain with neat diagram, Measurement of liquid level using gamma rays.

15 (a) Explain the working of capacitive microphone.
     (b) Sound pressure level measured at 10m from an automobile horn is 110db. Determine the sound pressure level at distance of (a) 20m and (b) 80m assume that the inverse square law holds good between intensity and distance.

16 (a) Explain in detail Rotating vane meter.
     (b) Explain the working of Flow nozzle with neat diagram.

17 (a) Write a short note on Bonded Strain gauge accelerometer.
     (b) Explain in detail radiation pyrometer.

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FACULTY OF ENGINEERING

B.E. (ECE) V - Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Analog Communication

Time: 3 hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions.   **(10 x 2 = 20 Marks)**

1. Define modulation. Explain the need for modulation.

2. The total power of an AM signal of 60% modulation is 40 KW. Calculate the carrier power and power in each sideband.

3. Explain the principle of indirect method of FM generation.

4. The modulation index of an FM signal is β. If now the amplitude of the modulating signal is halved and its frequency is tripled. Calculate the new modulation index.

5. Distinguish between the High level and Low level modulation in the context of AM transmitters.

6. When a superheterodyne receiver is tuned to 545 kHz, its local oscillator provides a signal of frequency of 1000 kHz. Calculate the image frequency.

7. Discuss the choice of minimum sampling frequency of a Bandpass signal.

8. What is Aperture effect caused by flat-top sampling?

9. Define and discuss "Equivalent Noise Bandwidth" of a filter.

10. A single tone frequency modulated signal of modulation index β=4 is applied to a FM detector. Calculate the approximate Noise figure.

PART – B

Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11 (a)   Discuss the working principle of product modulator for the generation of DSB-SC signals.

      (b)   A certain transmitter radiates 9 kW with the carrier unmodulated and 10.125kW when the carrier is sinusoidally modulated. Calculate the modulation index. If another wave, corresponding to 40% modulation is transmitted simultaneously, determine the total radiated power.

12 (a)   An AM signal given by s(t)=10[1+0.5cos(2000πt)] cos(20000πt). Sketch the amplitude spectrum. Find modulation index, sideband power, total power and transmission efficiency.

      (b)   Discuss the principle of coherent detection of demodulation of SSB signals.

13 (a)   Define FM. Derive the expression for a single-tone frequency-modulated wave.

   (b)   An angle-modulated signal is given by $s(t)=5\cos[2\pi(10^6 t)]+0.2\cos 200\pi t]$ what specific form of angle modulation is this?

14 (a)   Explain the principle and operation of super heterodyne receiver. How is it superior to TRF receiver?

   (b)   In a superheterodyne receiver with no RF section, the 'Q' of the antenna coupling circuit is 110. Calculate the image frequency and its rejection ratio at an incoming signal frequency 1100 kHz, if the intermediate frequency is 455 kHz.

15 (a)   State and prove sampling theorem for low pass signals.

   (b)   The low pass message signal(t)=6cos 500πt is ideally sampled at a sampling rate of 600 samples/sec. Sketch the spectrum of the sampled signal.

16 (a)   Derive the expression for the Noise figure for coherent detection AM DSB SC signals.

   (b)   Calculate the thermal noise voltage across a resistor of 1MΩ at an ambient temperature of 27°C.

17   Write short technical notes:
   (a)   Quadrature Null Effect
   (b)   Double Spotting
   (c)   Spectrum of naturally sampled signal

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FACULTY OF ENGINEERING
BE (MECH) V Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Fluid Mechanics and Hydraulic Machinery

Time: 3 Hours   Max marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: **Answer all questions**.   **(10 x 2 = 20 Marks)**

1. Define surface tension and vapour pressure
2. State the relation among the absolute pressure and gauge pressure
3. Explain the flow through pipes in series and in parallel
4. If a potential function is given by $\varnothing = 3 (x^2 + y^2)$ calculate the velocity components at the point (2,3)
5. State assumptions in Euler's equation of flow
6. State Hagen poisillie principle for viscous flow
7. Detail the classification of pumps
8. List the components of Francis turbine
9. Define hydraulic efficiency of centrifugal pump
10. Compare the Pelton wheel and Francis turbine

PART – B

Note: **Answer any five questions**.   **(5 x 10 = 50 Marks)**

11. a) A simple U-tube manometer containing mercury is connected to a pipe in which a fluid of sp. Gravity 0.8 and having vacuum pressure is flowing. The other end of the manometer is open to atmosphere. Find the vacuum pressure in pipe, if the difference of mercury level in the two limbs is 40cm and height of the fluid in the left from the center of the pipe is 15cm below.

   b) Two large plane surfaces are 150mm apart, the space between the surface is filled with oil of viscosity 0.972 pa-s A flat thin plate of $0.5m^2$ area moves through the oil at velocity of 0.3m/s, Calculate the drag force when the plate is in middle of two plane surfaces.

12. In a two dimensional incompressible flow, the fluid velocity components are given by u = x-4y, v = -y-4x. Show that velocity potential exists and determine its form. Find also the stream function.

13. The top and bottom diameters of a 2m long vertical tapering pipe are 10cm and 5cm respectively. Water flows down the pipe at 30 liters per second. Find the pressure difference between the two ends of the pipe.

14. a) Show that the pressure gradient in the direction of motion of the fluid is equal to the shear gradient normal to the direction of motion.
   b) Find the diameter of the pipe which will discharge 16.25 litres of oil per second at 10°C. Assume laminar flow with Reynolds number equal to 2320. Take kinematic viscosity = 0.0625 stoke.

15. a) Derive the equation for acceleration pressure head of a reciprocating pump
   b) A centrifugal pump running at 1450 rpm discharges 110 liters per second against a head of 23 meters. If diameter of the impeller is 25cm and its width is 5cm, find the vane angle at the outer periphery. The manometric efficiency of the pump is 75%

16. a) A Francis turbine working under a head of 5m at a speed of 210 rpm develops 75k W when the rate of flow of water is 1.8m^3/sec. If the head is increased to 16m, determine the speed, discharge and power.
   b) Explain briefly the principles on which a Kaplan turbine works

17. a) Two jets strike at bucket of a Pelton wheel, which is having shaft power as 14,715kW. The diameter of each jet is given as 150mm. If the net head on the turbine is 500m, find the overall efficiency of the turbine Take C_v = 1.0.
   b) Derive the equation for minimum starting speed of a centrifugal pump.

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FACULTY OF ENGINEERING
B.E. (PROD) V Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Machine Tool Design

Time: 3 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)
PART – A

Note: Answer all questions.   **(10 x 2 = 20 Marks)**

1. Sketch a slider crank mechanism.
2. Discuss about N.C. Machines.
3. Draw the arrangement for a clutched drive.
4. What is a ray diagram? Explain its significance.
5. What is pre-selected gear box? Explain it briefly.
6. What are the materials used for machine tool guide ways?
7. Discuss the factors relevant to the design of machine tool spindles.
8. What are the advantages of hydraulic drives?
9. Sketch any two types of check valves.
10. What is the purpose of the main spindle?

PART – B

Note: Answer any five questions.   **(5 x 10 = 50 Marks)**

11. (a) Discuss the features of special purpose machine tools.
    (b) Explain various mechanisms used for intermittent motion.

12. Explain the principles of gear box design with an example.

13. Compare and distinguish the design features of guide ways and slide ways, Give two examples for each in general purpose machine tools.

14. (a) How the bearings are selected for the machine tool spindles.
    (b) Discuss about various materials used for spindles.

15. (a) What are the various flow control valves used in practice. Explain their advantages.
    (b) How the speed regulation of grinding machine is being done. Explain it in detail.

16. Explain stepped regulation of speeds in a machine tool. Explain why Geometrical progression is used in machine tool drives.

17. Answer the following
    (a) Transfer Machines
    (b) Meander drives
    (c) Accumulator

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FACULTY OF ENGINEERING

B.E (AE) V Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Internal Combustion Engines.

Time: 3 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: **Answer all questions**.   **(10 x 2 = 20 Marks)**

1. Sketch P-V diagram of diesel cycle and name the processes.
2. Give two differences between petrol and diesel engines.
3. What is injection lag?
4. What is the function of governor in fuel systems?
5. Sketch a spark plug and label the parts.
6. List few properties of lubricants.
7. What is super charging, what are its types?
8. Define knocking phenomenon in SI engines.
9. What are engine emission standards?
10. What are the variables effecting engine performance.

PART – B

Note: **Answer any five questions**.   **(5 x 10 = 50 Marks)**

11. (a) Explain Otto cycle with the help of P-V diagram and also derive air standard Efficiency.

    (b) Calculate thermal efficiency of an Otto cycle working with maximum temperature of 1400°C and minimum temperature of 42°C. If the compression ratio is 10 and pressure of air at the beginning of the compression is 1.5 bar, then estimate the mean effective pressure.

12. Explain with the help of a sketch, the working of pneumatic governor.

13. Explain the working of battery ignition system with the help of a neat circuit diagram.

14. (a) Explain the stage of combustion in case of CI engine with the help of P-Ө diagram.
    (a) What are design considerations of combustion chamber of SI engines?

15. Explain various methods to improve engine performance.

16. (a) Differentiate between 2-Stroke & 4-Stroke engines.
    (b) Explain wet sump lubrication system.

17. (a) What is the effect of turbo charging on power output of engine?
    (b) What is the function of fuel feed pump. Mention its types.

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FACULTY OF ENGINEEERING

B.E. (CSE) V Semester (AICTE) (Main & Backlog) Examination,
March / April 2022

Subject: Software Engineering

Time: 3 Hours   **Max. Marks: 70**

(Missing data, if any, may be suitably assumed)

PART – A

Note: **Answer all questions**.   **(10 x 2 = 20 Marks)**

1   What is Generic software process?
2   Differentiate between personal and team process models.
3. What is requirement engineering?
4. What are the principles of modeling?
5. Write short notes on context level DFD.
6. What is data modeling? What is its importance?
7. List the Golden Rules of User Interface Design?
8. Define coupling. List various types of coupling.
9. What metrics can be used for source code evaluation?
10. What is Regression Testing?

PART – B

Note: **Answer any five questions**.   **(5 x 10 = 50 Marks)**

11. (a) Discuss prototyping based development model. Write its advantages and advantages.
    (b) Explain any 2 agile process models.

12. (a) Explain business process engineering.
    (b) Describe requirement engineering tasks.

13. (a) Explain in detail about flow-oriented modeling.
    (b) Explain design concepts.

14. Explain architectural styles and patterns in detail.

15. (a) Define software testing. Explain alpha and beta testing.
    (b) Explain the concept of basis path testing in detail with the help of an example.

16. (a) List out ISO quality factors and discuss metrics for maintenance.
    (b) Explain white box testing.

17. Write a short notes on:
    (a) Unified Process Model.
    (b) Design evaluation.

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FACULTY OF ENGINEERING
B.E. (CME) V Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Software Engineering

Time: 3 Hours   Max. Marks: 70

(Missing data, if any, may be suitably assumed)
PART – A

Note: Answer all questions.   **(10 x 2 = 20 Marks)**

1. Define Software Engineering.
2. What is Pattern? Define Process patterns.
3. What is Information hiding?
4. Define Abstraction.
5. Write short notes on Design Evaluation.
6. Write short notes on Design quality.
7. What is regression testing?
8. What is QFD?
9. What is Agile Process?
10. Explain Personal and Team process.

PART – B

Note: Answer any five questions.   **(5 x 10 = 50 Marks)**

11. Explain CMM. What are various levels of CMMI represents? What are the key process areas associated with each level of CMM?

12. (a) Write short notes on specialized process models?

    (b) Explain extreme programming in detail.

13. (a) Briefly explain the guidelines for flow oriented modeling with example?

    (c) Write a short note on translation from analysis model to design model with a neat sketch?

14. Distinguish between the following architectural styles with examples.

    (a) Data centered architectures.

    (b) Data flow architecture.

    (c) Layered Architecture.

15. What is software component? Explain the different views of a software component.

16. (a) Explain golden rules performed in User Interface design.

    (b) What is the process of evaluating interface design?

17. What are different types of testing? Explain white box testing in detail.

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FACULTY OF ENGINEERING
B.E. (I.T) V – Semester (AICTE) (Main & Backlog) Examination, March / April 2022

Subject: Software Engineering

Time: 3 Hours   Max marks: 70

(Missing data, if any, may be suitably assumed)

PART – A

Note: **Answer all questions**.   (10 x 2 = 20 Marks)

1. Differentiate between Software Product and Software Process?
2. What is agility in software process?
3. What are software myths?
4. Discuss the need of Requirements Engineering
5. Define Risk in Software development. What are the characteristics of Risk?
6. What is RMMM Plan in risk management?
7. What is White Box Testing?
8. What is Verification and Validation in Software Testing?
9. What are different SPI processes?
10. What are the Software Configuration Management (SCM) elements?

PART – B

Note: **Answer any five questions**.   (5 x 10 = 50 Marks)

11 a) Discuss the principles of Agility.
   b) Explain Extreme Programming (XP) in detail.

12 a) Describe different types of Process flows.
   b) Explain the types of Evolutionary Process Models.

13 Explain the different tasks that are performed in Requirements Engineering.

14 a) Explain Software Quality Attributes and Software Quality Guidelines in the design of Software project
   b) What are the Design Classes? Explain in detail.

15 a) Describe Framework of SPI. Explain elements of SPL Framework.
   b) Discuss COCOMO models for Software Project estimation.

16 a) What is SQA in Software development? Discuss the elements of SQA.
   b) Explain goals of SQA.

17 a) Explain Test Strategies for Conventional Software.
   b) Explain the concept of Basis Path Testing.

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FACULTY OF ENGINEERING
BE III / IV (Civil) I - Semester (NON-CBCS) (Backlog) Examination, March / April 2022

Subject: Reinforced Cement Concrete

Time: 3 Hours   Max. Marks: 75

(Missing data, if any, may be suitably assumed)
PART – A
Note: Answer all questions   (25 Marks)

1   Explain the terms:
    (a) Standard deviation in strength of concrete.
    (b) Workability
2   Differentiate between working stress method and limit state method.
3   Define the effective flange width.
4   Discuss in brief the short term and long term deflection of RC beams.
5   What is the importance of Yield line theory?
6   What do you understand from interaction diagrams?
7   Give any two assumptions made in the design of columns.
8   How does water cement ratio effects the strength of concrete? Explain.
9   Explain the codal provisions in the design of slabs and beams.
10 How is one-way shear checked in Isolated footing?

PART – B
Note: Answer any five questions   (5 x 10 = 50 Marks)

11 (a) Explain the stress block parameters and obtain the expression for concrete
       members according to limit state method.
   (b) Explain briefly about the various tests for workability.

12 The cross-section of a simply supported RC beam is 230mmx 350mm to the
   centre of reinforcement which consist of 3-16 mmϕ. Determine from first principle
   the depth of neutral axis and the maximum stress in concrete when steel is
   stressed to 120N/mm^2. Take M = 19

13 A RCC beam of effective span 7m is simply supported at the ends. The overall
   size of the beam is restricted to 230mm x 500mm. The beam is subjected to a
   super imposed load of 50kN/m including the self weight. Design the beam for
   flexure and draw reinforcement details.

14 An RCC beam 230mm x 400mm consists of 2-16mmϕ and 2-12mmϕ on the
   tension face. The beam is provided with 8mmϕ dia mild steel stirrups at 160mm
   centre to centre and 2-12 mmϕ are bent at 45º. Use M20 grade concrete and
   Fe415 grade steel.

15 A hair has clear dimension 3mx8m with wall thickness 230mm. The
   superimposed load on slab is 5kN/m^2 and finishing load is 1.2kN/m^2. Design the
   slab. Adopt M20 grade concrete and Fe415 grade steel. Sketch Reinforcement
   details.

                                                                     ..2

16 A reinforced concrete column of 3.0m effective length carries axial load of 1500kN. Design the column using M25 grade concrete and Fe500 grade steel. Sketch the reinforcement details.

17 Design a footing for rectangular column 400mm x 500mm carrying an axial service load of 1600kN. The SBC of soil is 180 kN/m^2. Use M25 grade concrete and Fe500 grade steel.

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FACULTY OF ENGINEERING
**BE III / IV (EEE) I Semester (NON-CBCS) (Backlog) Examination,
March / April 2022**
Subject: Power Systems - II

TIME: 3 hours   Max. Marks: 75

(Missing data, if any, may be suitably assumed)
PART – A
Note: Answer all questions   **(25 Marks)**

1. What do you understand by the generalized constants of a transmission line? What is their significance?
2. Brief about the methods of reducing corona effect.
3. What is a booster transformer?
4. Explain the switching sequence for on load tap changing transformer.
5. Explain the working principle of thyristor controlled reactors.
6. Draw the connection of sequence networks for double line to ground fault through impedance.
7. Write the positive, negative, zero sequence current equations when double line to ground fault is at the terminal of the alternator.
8. Explain the theory of symmetrical components.
9. The generator emf is 1 p.u. and the sub transient reactance is 25%. Find the transient current.
10. Discuss the behaviour of travelling wave when it reaches the end of a short circuited transmission line.

PART - B
Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11.   (a) A 3-phase 220 KV 50Hz transmission line consists of 1.55cm radius conductor spaced 2m apart in equilateral triangular form. If the temperature is 40^0 C and atmospheric pressure is 76cm, Calculate the corona loss per km of the line.(Take m_0=0.85)
      (b) Explain about the critical disruptive voltage of a single transmission line.

12.   (a) A 3-phase 30 MVA, 33 KV alternator has 4% reactance (internal) and negligible resistance. Find the external reactance per phase to be connected in series with the alternator so that steady current on the short circuit does not exceed 10 times of load current.
      (b) Show that positive and negative sequence currents are equal in magnitude but out of phase by 180 degrees in a line to line fault. Draw the interconnection diagram of sequence network.

13.   (a) Explain the operation of a basic thyristor controlled reactor with necessary diagram, equations and waveforms.
      (b) Explain the method to determine the synchronous phase modifier capacity with necessary Phasor diagram.

14. (a) A 25 MVA, 11KV 3-phase 50 HZ alternator has direct axis sub transient reactance (X_d") of j0.25pu; X_2= j0.35pu, X_0= j0.1pu. The neutral is solidly grounded. Determine the sub transient current in the generator and line to line voltages when a line to line fault occurs between Y and B phases.

   (b) Write the boundary conditions of L-L-G fault.

15. (a) For the system shown in figure, Draw the reactance diagram assuming the Base MVA as 100 MVA and Base voltage as 33KV.
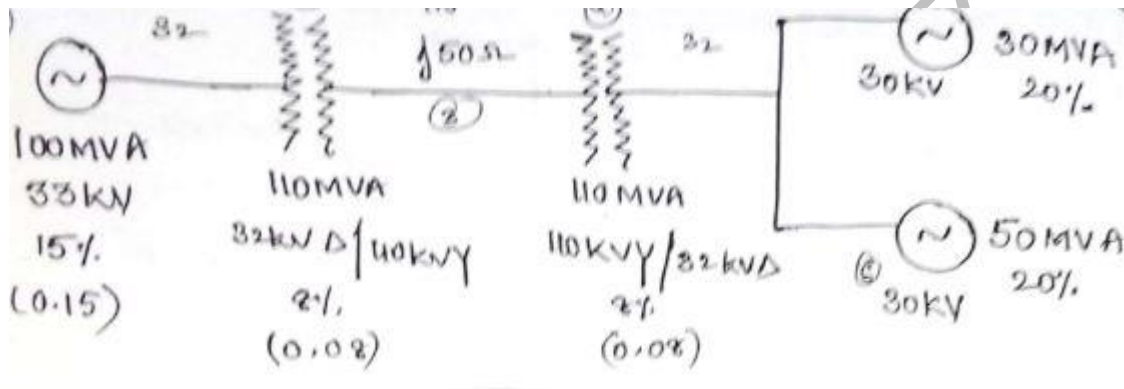
   (b) Write the advantages of per unit system.

16. (a) Explain in detail about Bewley Lattice diagrams.

    (b) Starting from first principles, show that surges behave as travelling waves. Find the expression for surge impedance and wave velocity.

17. (a) List out the assumptions made to perform short circuit analysis.

    (b) Derive the expression for voltage and current for a double line to ground fault on a power system.

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FACULTY OF ENGINEERING
B.E. III / IV (ECE) I Semester (NON-CBCS) (Backlog) Examination, March / April 2022
Subject: Linear Integrated Circuits & Applications

Time: 3 Hours   **Max. Marks: 75**

(Missing data, if any, may be suitably assumed)

PART – A

Note: Answer all questions   **(25 Marks)**

1 Define Slew rate and PSRR of OP AMP.
2 What are the characteristics of ideal OP AMP?
3 Explain how OP AMP works as V to I converter.
4 Draw the circuit of an ADDER using OP AMP and explain.
5 Briefly write about precision clamper.
6 What are the advantages of active filters over passive filters?
7 Explain working principle of VCO.
8 Define lock range and capture range of PLL.
9 What are the specifications of A/D Converters?
10 Explain features of IC voltage regulators 723.

PART – B

Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11 (a) Design a differentiator at frequency 2 KHz and draw the circuit of practical differential using OP AMP.
   (b) If a sine wave of 2Vp-p is applied, find output voltage and draw the waveform.

12 (a) Explain Schmitt trigger using OP AMP.
   (b) Draw instrumentation amplifier using OP AMP and explain.

13 (a) Design a second order active high pass filter at cutoff frequency of 3 KHz.
   (b) List all the applications of PLL.

14 Explain operation of NE 555 Timer as monostable multivibrator. Derive expression for pulse width.

15 (a) Explain working of successive approximation A/D converter.
   (b) Draw circuit of fullwave rectifier using OP AMP and explain its working with waveforms.

16 (a) Explain operation of sample and hold circuit using OP AMP.
   (b) Describe working of ANTILOG amplifier using OP AMP.

17 Write short notes on:
   (a) Saw tooth generator using OP AMP.
   (b) Linear regulators using OP AMP.

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FACULTY OF ENGINEERING
B.E. III / IV (MECH) I Semester (NON-CBCS) (Backlog) Examination, March / April 2022

Subject: Applied Thermodynamics

Time: 3 hours   Max. Marks: 75

(Missing data, if any, may be suitably assumed)
PART – A

Note: Answer all questions   **(25 Marks)**

1   Explain the difference between double acting and double stage reciprocating air compressor.
2   Explain about perfect intercooling in Reciprocating air compressors?
3   Give any two general classifications of engines and how they differ in principle.
4   How auto-ignition occurs in S.I engines.
5   State any three general classification of Boilers.
6   Define brake specific fuel consumption for an IC engine.
7   List some demerits of anti knocking additives.
8   What are Boiler mountings?
9   What type of nozzle is used for compressible fluids and why?
10 Explain Modified Rankine cycle.

PART – B

Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11 a) Define volumetric efficiency and obtain an expression for it in case of a reciprocating air compressor.
   b) A single-acting single-cylinder reciprocating compressor has a cylinder diameter of 200 mm and a stroke of 300 mm air enters the cylinder at 1 bar and 27^0C, it is then compressed polytropically to 8 bar according to the law $PV^{1.3}=C$. If speed of compressor is 250 rpm, calculate the mass of air compressed per min and power required in KW to drive the compressor.

12   Discuss how knocking takes place in SI and CI engines. What are the geometrical design considerations to prevent knocking in SI engines?

13 a) Explain the working principle of a cooling tower.
   b) Discuss about the classification of steam condensers.

14 a) Write down the differences between water tube boiler and fire tube boiler.
   b) Define draught in the boilers.

15   Steam enters a convergent-divergent nozzle at 15 bar and 300^0C and leaves at a pressure of 2 bar. The inlet velocity to the nozzle is 150m/s. Find the required throat and exit areas for a mass flow rate of 1 kg/s. The nozzle efficiency is 90% and C_P=2.4 kJ/kg^{0}K.

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16   Explain the reheat cycle in Rankine cycle with a neat sketch and derive its efficiency.

17   Write short notes on:
   a) Mist type lubrication.
   b) Flame front propagation.

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FACULTY OF ENGINEERING
B.E. III / IV (CSE) I - Semester (NON-CBCS) (Backlog) Examination, March / April 2022

Subject: Database Management Systems

Time: 3 hours   Max. Marks: 75

(Missing data, if any, may be suitably assumed)

PART – A
Note: Answer all questions   **(25 Marks)**

1   What are Domain Constraints? List all of them.
2   Define weak entity set? Howa weak entity set is represented in E-R Model?
3   Write the Fundamental Relational algebra operations with symbols. And justify how SELECT statement of Relational algebra operation is different from SQL SELECT
4   Define natural Join. Explain the natural join using SQL query.
5   Define Joins. What are the conditions of joins used in SQL?
6   What is Authorization? Different types of authorization that database needs to satisfy.
7   Draw the Sparse index using any example?
8   Define Conflict Serializability? Draw the Truth table for it using Read and Write Operations?
9   Explain Recoverability?
10   Explain Cascade less schedules?

PART – B
Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11 a) List the various applications of Databases.
   b) Explain different architectures of database applications?

12 a) Explain extended relational algebra operations?
   b) Discuss the various types of SET operations used in SQL, with syntax.

13 a) Define function in database? Write the syntax?
   b) Differentiate between Sparse and Dense indexing techniques?

14 a) Construct the B+ tree index structure for the given set of search keys that can accommodate four (4) pointers in a node. 2 3 5 7 11 17 19 23 29 31 35
   b) Differentiate between Static Hashing and Dynamic Hashing.

15 a) Explain Time-Stamp based locking protocol?
   b) Explain ARIES Algorithm?

16 a) Explain bitmaps indexing technique with an appropriate example?
   b) What are Deadlock prevention techniques? Explain

17 Write short notes on the following:
   a) Arm strong axioms
   b) Bitmap Indices.
   c) Dynamic SQL.

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FACULTY OF ENGINEERING
B.E. III / IV (IT) I - Semester (NON-CBCS) (Backlog) Examination,
March / April 2022
Subject: Database Management System

Time: 3 Hours   Max. Marks: 75

(Missing data, if any, may be suitably assumed)
PART – A
Note: Answer all questions   **(25 Marks)**

1) What is the need of data model in DBMS and give its classification.
2) Distinguish between primary and super keys.
3) Define a surrogate key? How can it be used for schema refinement?
4) Difference between wait/die with wound/wait scheme.
5) Write the syntax for UPDATE command in SQL.
6) Write about advantages of check pointing.
7) Define deadlock with an example.
8) Draw and explain state diagram of transaction.
9) Describe about recoverability?
10) Write about ACID properties?

PART – B
Note: Answer any five questions   **(5 x 10 = 50 Marks)**

11) a) Explain in detail about Database Management System advantages over file management system.
    b) Explain briefly about E-R diagram with suitable examples

12) Construct an ER diagram for university registrar's office. The office maintains data about each class, including the instructor, the enrollment and the time and place of the class meetings. For each student class pair a grade is recorded. Determine the entities and relationships.

13) a) Explain briefly about aggregate function with example query.
    b) Explain different types of Joins with examples?

14) a) How to compute closure of set of functional dependency? Explain with a suitable example schema.
    b) What is multi valued dependency? State and explain fourth normal form based on this concept.

15) a) Explain briefly about view serializability
    b) Explain about hash based indexing with an example.

16) a) Distinguish between: i) Primary and Secondary indexing. ii) Ordered indexing and hashing.
    b) Explain in detail about B+ trees.

17) Write short notes on the following:
    a) Storage structures.
    b) Log based recovery.

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