Code No: 2082/BL

FACULTY OF ENGINEERING

BE 3/4 (Civil) I-Semester (Backlog) Examination, October 2020

Subject: Reinforced Cement Concrete

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

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Explain working stress method.
2 Differentiate between bleeding of concrete, Honey combing and segregation of concrete.
3 Draw stress-strain curve for mild steel, HYSD bars and for concrete.
4 Define characteristic load and partial safety factors.
5 Define development length.
6 Give IS specification for shear and Torsion.
7 Write the assumptions of yield line theory.
8 Differentiate between Balanced, under-Reinforced, and over-reinforced sections in working stress method.
9 What is the criteria for minimum eccentricity in column design?
10 How is two-way shear checked in Isolated footing?

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 (a) Explain briefly the various tests conducted on fresh concrete.
(b) What are the different limit states of design? What are the merits of limit state design philosophy over other design philosophies?

12 Determine the moment of resistance of a singly reinforced beam 160mmx 300mm deep to the centre of reinforcement. If the stresses in steel and concrete are not to exceed 140N/mm^2 and 5N/mm^2 respectively. The reinforcement consist of 4-16mmϕ. Take m=18. Also find the maximum load the beam can carry if the beam is used over a span of 5m. (working stress method).

13 Design a simply supported rectangular beam for an effective span of 6m. The superimposed load is 80kN/m and the size of the beam is restricted to 300mm/700mm overall. Use M20 grade concrete and Fe415 grade steel sketch Reinforcement details.

14 Design a beam for equivalent shear and equivalent B.M. for the following data: Mu=80kN-m; Vv=45kN; Tv=9kN-m; b=230mm; D=450mm use M20 grade concrete and Fe500 grade steel.

15 Design a slab for a room of 5.5m/4.0m clear in size if the super imposed load is 10kN/m^2 for edges simply supported corners held down. Use M20 grade & Fe415 grade materials. Sketch the reinforcement details.

16 Design a circular column to carry an axial working load of 1200kN. Use helical reinforcement as lateral reinforcement. Adopt M25 grade concrete and Fe500 grade steel. Sketch reinforcement details.

17 Design a square spread footing to carry a load of 1200kN from a 300mmx300mm column. The safe bearing capacity of soils is 120kN/m^2, the unit weight of soil is 18kN/m^3. Use M25 grade concrete and Fe500 grade steel. Sketch the reinforcement details.

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Code No. 2088/BL

FACULTY OF ENGINEERING

B.E. 3/4 (EEE) I – Semester (Backlog) Examination, October 2020

Sub: Power Systems-II

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

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Explain briefly the skin effect in transmission lines. What is its effect on the resistance of the line?
2 For a medium length nominal T transmission line draw the circuit and the phasor diagram for lagging power factor conditions.
3 What are the different methods used for voltage control of a power system?
4 Why it is necessary to keep the receiving end voltage constant within specified limits?
5 What is the need for the base values?
6 The generator emf is 1 p.u and the sub transient reactance is 20%. Find the transient current.
7 Explain the merits and demerits of per-unit system.
8 Show that I_{abc}= [A] I_{012}
9 What is travelling wave? Explain the development of such wave in transmission line.
10 Explain about double frequency transient.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 a) Derive equivalent parameters of two transmission lines when they are connected In parallel.
b) The generalized circuit constants of a transmission line are as follows:
A = D = 0.895 ∠1.4°, B = 182.5 ∠78.6° ohms
(i) If the line supplies a load of 50 MW at 0.9 p.f. and 220 kV, find the sending end voltage and hence the regulation of the line.
(ii) For a load of 80 MW at 0.9 p.f. lag, 220 kV, determine the reactive power supplied by the line and by the synchronous capacitor if the sending end voltage is 236 kV. Also determine the p. f. of the line at the receiving end.

12 Along with its advantages and disadvantages explain the following (with necessary diagrams):
(a) Series and shunt capacitors
(b) Booster transformer
(c) Thyristor switched capacitors.

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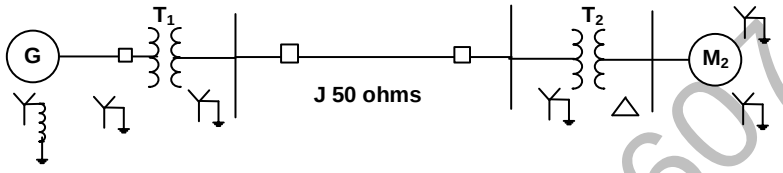
13 a) Explain the method of determining of Negative Sequence Reactance of an alternator.

b) Draw the pu impedance diagram for the power system shown in below figure. Neglect resistance and use a base of 100 MVA, 220kV in 50 ohms line. The ratings of the generator, motor and transformers are:
Generator40 MVA, 25 kV, X" = 20%, Motor 50 MVA, I I kV, X" = 30%
Y-Y transformer, 40 MVA, 33 Y - 220 Y,kV, X = I5%
Y-Delta transformer,30 MVA, 11 Delta - 220 Y kV, X = I5%



14 a) From fundamentals along with the necessary diagrams obtain the expressions for fault currents for an unloaded synchronous generator for the following types of faults. (assume the neutral is grounded through an impedance Z_n.)
(i) Single line to ground fault
(ii) Line to Line fault

b) Discuss in detail about the zero sequence arrangements in a three phase transformer connection.

15 a) Voltage from a dc source is applied to an overhead transmission line by closing as witch. The end of the overhead line is connected to an underground cable. Assume that both the line and the cable are lossless and that the initial voltage along the line is v^+ . If the characteristic impedances of the line and cable are 400 and 50 ohms, respectively, and the end of the cable is open-circuited, find in terms of v^+.
i) The voltage at the junction of the line and cable immediately after the arrival of the incident wave and
ii) The voltage at the open end of the cable immediately after arrival of the first voltage wave.

b) A travelling wave of 50 kV 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 50 km, and (ii) the power loss and the heat loss of the wave during the time required to traverse this distance. Neglect the losses in the insulation and assume a wave velocity of 3 × 105 km per second. Determine the corresponding values for a cable having surge impedance of 40 ohms and relative permittivity 4.

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

17 a) Derive the expression for visual critical disruptive voltage due to corona.

b) Discuss in detail about tuned lines.

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Code No. 2094/BL

FACULTY OF ENGINEERING

BE 3/4 (Inst.) I – Semester (Backlog) Examination, October 2020

Sub: Instrumentation Systems

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

PART – A

Note: Answer any seven questions. **(7x3 = 21 Marks)**

1 Define critical velocity.
2 Define laminar flow.
3 Why angular velocity measurement method is preferred to measure linear velocity?
4 Discuss crystal hygrometer.
5 What is seebeck effect?
6 What is the principle of ultrasonic method for measurement of liquid level?
7 What is thermopile?
8 Define SPL.
9 Discuss Signal to noise ratio.
10 Draw solid cylinder strain gauge accelerometer.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 a) Differentiate between DC Tachogenerator and AC Tachogenerator.
b) Explain electromagnetic velocity transducer. With neat diagram

12 a) Explain laws of thermocouple in detail.
b) Explain the need of humidity measurement in industries.

13 a) Explain in detail Aluminum Oxide Hygrometer. With neat diagram
b) Explain the working of Flow nozzle with neat diagram.

14 a) Sound pressure level measured at 10m from an automobile horn is 110db. Determine the sound pressure level at distance of
i) 20m and
ii) 80m assume that the inverse square law holds good between intensity and distance.
b) Explain capacitor type microphone in detail.

15 Explain with neat diagram venturimeter for measurement of volumetric flow rate. Write its advantages and disadvantages.

16 Explain with neat diagrams Absorption Dynamometers. .

17 Write a short notes on
a) Electromagnetic flow meter.
b) Measurement of P^H.

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Code No. 2096/BL

FACULTY OF ENGINEERING
B.E. 3/4 (ECE) I – Semester (Backlog) Examination, October 2020
Subject: Linear Integrated Circuits and Applications

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

PART – A

Note: Answer any seven questions. **(7x3= 21 Marks)**

1. What is constant current bias? Draw its equivalent circuit.
2. Draw the pin configuration of IC 741and write its features.
3. Draw and explain the Op-Amp differential amplifier circuit.
4. Explain virtual ground concept.
5. Draw the circuit of first order wide band pass filter.
6. What is an negative comparator?
7. Explain how PLL is used as Frequency Multiplier.
8. Draw block diagram of a PLL IC.
9. Classify Analog to Digital Converters.
10. What is current fold back technique using IC723? Draw its characteristics curve.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. (a) Explain measurement procedure for the following parameters:
    (i) Input Offset voltage (ii) Input offset current (iii) Input bias current.
    (b) Explain level translator
12. (a) Explain the working of Op-Amp closed loop inverting amplifier and derive its voltage again.
    (b) With the neat diagram explain the operation of voltage follower and sample and hold circuit using Op-Amp.
13. (a) Explain the operation of triangular waveform generator using Op-Amp and derive the expression of frequency for oscillations.
    (b) Explain Schmitt Trigger using Op-Amp.
14. (a) Explain the working of R-2R ladder types DAC and state its important features.
    (b) List the specifications of ADC.
15. (a) Explain the working of PLL and explain any one application of the same.
    (b) Design and explain with neat sketch, a Monostable multivibrator using IC 741.
16. (a) Design a second order butterworth wide band pass filter with FL=1KHz and FH=5KHz and pass band gain of 5.
    (b) Explain the working of function generator using XR2206.
17. (a) Explain instrumentation amplifier.
    (b) Draw the functional diagram of IC 723 regulator. Explain its operation.

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Code: 2104/BL

FACULTY OF ENGINEERING

B.E. 3/4 (Mech.) I–Semester (Backlog) Examination, October 2020

Subject: Applied Thermodynamics

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

PART – A

Note: Answer any seven questions. (7x3= 21 Marks)

1 Explain the difference between double acting and double stage reciprocating air compressor.
2 Define the clearance ratio for a reciprocating air compressor and its significance.
3 Write the formula of friction power and what are the methods used to find the friction power.
4 Write the importance of turbulence effect in S.I. engines.
5 Define brake specific fuel consumption, brake thermal efficiency and, indicated thermal efficiency of an I.C. engine.
6 What are the engine parameters effected in knocking of C.I. engine.
7 Write the classification of Boilers.
8 Define the condenser and explain any jet type condenser.
9 Define nozzle efficiency.
10 Define steam rate in Rankine cycle.

PART – B

Note: Answer any three questions. (3x18 = 54 Marks)

11 In a three- stage compressor, air is compressed from 98kPa to 20bar. Calculate for $1m^3$ of air per second, i) Work under ideal condition for $n = 1.3$, ii) Isothermal work, iii) Saving in work due to multi staging. iv)Isothermal efficiency.

12 A test on a single cylinder, four stroke oil engine having bore 18cm and stroke 36cm yielded the following results; speed =285rev/min; brake torque = 393Nm; indicated m.e.p = 7.2bar; fuel consumption = 3.5kg/hr; cooling water flow = 4.5kg/min; cooling water temperature rise = 36^0 C; air-fuel ratio by mass = 25; exhaust gas temperature = 415^0C; barometric pressure = 1.013bar; room temperature = 21^0C; the fuel has a calorific value of 45200kJ/kg; Determine i) indicated thermal efficiency; ii) the volumetric efficiency based on atmospheric conditions and draw a heat balance sheet in terms of kJ/min and take R= 0.287kJ/kgK.

13 a). Explain the combustion Phenomenon of S.I. engine using pressure Vs. crank angle diagram.
b). Write short notes about Mist lubrication system.

14 Sketch and label the following. Also explain their functioning.
a. Benson boiler. b. Ejector condenser.

15 A steam power plant operates on a theoretical reheat cycle. The steam from boiler at 150bar and 550^0C expands through the high pressure turbine. It is reheated at constant pressure of 40bar to 550^0 and expands through the low pressure turbine to a condenser pressure of 0.1bar. Draw *T-s* and *h-s* diagram and find.
i) Quality of steam at turbine exhaust, ii) Thermal efficiency of the cycle, iii) Steam rate in kg/ kWh.

16 Explain the types of the nozzle and derive condition for critical pressure of the nozzle.

17 Write short notes on the following.
a. Magneto ignition system. b. Zenith carburetor.

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Code No: 2109/BL

FACULTY OF ENGINEERING

B.E. 3/4 (Prod.) I – Semester (Backlog) Examination, October 2020

Subject: Applied Thermodynamics and Heat Transfer

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

PART – A

Note: Answer any seven questions. **(7x3= 21 Marks)**

1 Write the applications of compressed air.
2 What is the effect of clearance volume on performance of air compressor?
3 Mention the applications of IC engines.
4 What is mean effective pressure? How brake mean effective pressure is determined?
5 What is the necessity of lubrication in IC engines?
6 What is meant by ignition delay?
7 Explain contact resistance in conduction heat transfer.
8 Write expressions for critical radius of insulation cylinder and sphere.
9 What is the difference between convective heat transfer coefficient and overall heat transfer coefficient?
10 What is the significance of Grashof number in free convection?

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 A single acting two stage reciprocating air compressor with perfect intercooling delivers 10.5 kg/min of air at 16 bar. The suction occurs at 1bar and 27 ◦C. The compression and expansion processes are with polytropic index 1.3. Calculate
(a) power required to drive compressor
(b) isothermal efficiency

12 (a) Write the differences between SI engines and CI engines.
(b) Discuss the differences between ideal and actual valve timing diagram.

13 (a) Describe normal combustion and abnormal combustion in CI engines.
(b) Describe a method for measuring volume of air sucked in IC engines.

14 (a) Explain why critical radius of insulation exists.
(b) Derive expression for critical radius of insulation for cylinders.

15 (a) Why LMTD is used instead of simple temperature difference for finding heat transfer in heat exchangers ?
(b) Derive expression for LMTD for counter flow heat exchanger.

16 The following observations were recorded during a test on a Single cylinder oil engine. Bore=300mm, stroke =450mm, speed=300rpm, indicated mean effect tive pressure = 6 bar, net brake load= 1.5 KN , brake drum diameter = 1.8 m , brake rope diameter= 2 cm . Calculate (a) Indicated power (b) brake power (c) mechanical efficiency (d) frictional loss.

17 A brick wall is exposed on one side to a heat flux of 2250 w/ m^2. The wall is 12cm thick and of thermal conductivity 0.3 W/m^ok .
(a) Determine the temperature drop in the wall under steady state condition.
(b) if the other side of the wall is exposed to radiation to surroundings at 30^{o}C, determine wall surface temperature, assuming unity shape factor.

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Code No.2112/BL

FACULTY OF ENGINEERING

B.E. 3/4 (AE) I-Semester (Backlog) Examination, October 2020

Subject : Automotive Diesel Engines

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

PART – A

Note: Answer any seven questions. **(7x3= 21 Marks)**

1 Define cetane number and ignition quality.
2 What are the good qualities of fuel used in compressor ignition engines?
3 What is PTFI?
4 Define maximum speed and all speed governor.
5 Define the terms swirl and squish.
6 What are the applications of pintle nozzle?
7 What is delay period? how to measue it?
8 What are the applications of superchanging?
9 What is the Bharat and euro norms of standard of pollution.
10 Draw the performance maps of diesel engine.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 Sketch Dual cycle on P-V and T-S diagram and derive an equation for thermal efficiency of dual cycle and also write the equation for mean effective pressure.

12 Descirbe the construction and working of the jerk type fuel injection pump with a neat sketch.

13 Describe with suitable sketches, the various stages of combustion in a diesel engine.

14 What is turbo charging explain with suitable diagram and how it is advantageous

15 Explain the variables that affect the performance of an automotive diesel engine and describe how the engine performance maps are obtained.

16 What are the methods used for calibrating fuel injection pump? Explain in detail

17 What is the data required for drawing heat balance sheet? Explain with suitable examples.

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Code No. 2116/BL

FACULTY OF ENGINEERING

B.E. 3/4 (CSE) I Semester (Backlog) Examination, October 2020

Subject: Database Management System

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

PART – A

Note: Answer any seven questions. **(7x3= 21 Marks)**

1 What is the need of data model in DBMS and give its classification.
2 Differentiate between weak entity and strong entity.
3 What is a surrogate key? How can it be used for schema refinement?
4 Write about rename and division operator in relational algebra.
5 Differentiate between Replace and Translate with example.
6 Discuss the problems caused by redundancy and the purpose of normalization.
7 Draw and explain state diagram of transaction.
8 Compare wait/die with wound/wait scheme?
9 What is a trigger? How to create it? Discuss various types of triggers?
10 Describe the steps in crash recovery in ARIES.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11. a) Draw and explain three-tier schema architecture of database system.
b) What are the major components used in E-R diagram design?

12 a) Discuss the extended relational algebra operations with examples.
b) What is NULL? What is its importance? How are these values handled in relational model?

13 a) Consider the following database schema to write nested queries in SQL
Supplier (id, name, city)
Parts(pno, pname, pdescription)
Supply(id, pno, cost)
i) Find the names of the parts supplied by “RamRaj”
ii) Find the names of the suppliers who supply “Nuts”
iii) Find the cost of bolts being supplied by Nagpur suppliers.
Insert the following keys in a B+-tree for order n given below
(a) n = 4
(b) n = 6
2,3,5,7,9,11,17,19,23,29,31
b) Explain briefly about view serializability.

14 a) Is B+ tree, a multi level indexing? How does it differ from B-tree?
b) How deadlocks are handled. Explain in detail.

15 a) Write about multiple granularity and validation based protocol in detail.
b) Explain briefly about aggregate function with example query.

16 a) Explain about hash based indexing with an example.
b) What is dynamic hashing? Give the implementation details of it.

17 Explain about the following clauses with example queries.
(i) Group by
(ii) Order by
(iii) Aggregation functions.
(iv) B+ trees

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Code No. 2121/BL

FACULTY OF ENGINEERING

B.E. ¾ (IT) I- Semester (Backlog) Examination, October 2020

Subject: Database Management Systems

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

PART – A

Note: Answer any seven questions. **(7x3= 21 Marks)**

1 List the Database Administrators functions.
2 Discuss Entity-Relationship diagrams in brief.
3 Discuss SQL sub languages.
4 Discuss about group by clause and having clause.
5 What is Embedded SQL?
6 Define Trigger. Write syntax of Trigger.
7 Define ACID properties.
8 What is the difference between primary and secondary index?
9 What is stable storage?
10 Define recoverability.

PART – B

Note: Answer any three questions. **(3x18 = 54 Marks)**

11 a) Explain the Differences between File Processing System and DBMS.
b) Explain Database architecture with neat diagram.

12 a) Explain String Operations and Aggregate functions in SQL.
b) Explain Fundamental and Additional Relational-Algebra Operations with suitable example.

13 a) Write types of Normal forms with suitable example for each.
b) Discuss Features of Good Relational Design.

14 a) Insert the following keys in a B+ tree for the order n=3
5 7 23 36 2934 39 42 47 51 5559 62
b) Explain bit map indices? How they are useful in multi key access.

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

16 a) Explain Log based recovery.
b) Explain Multiple Granulity Protocols.

17 Write short notes on
a) Recursive Queries
b) Storage Structure
c) Thoma's write Rule

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Code NO. 2597/CBCS /BL

FACULTY OF ENGINEERING

B.E. V- Semester (CBCS) (Civil) (Backlog) Examination, October 2020

Subject : Reinforced Cement Concrete

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

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. Differentiate between working stress method and limit state method.
2. Calculate minimum reinforcement required for a RC section 230mm x 500mm. assumeFe500 steel.
3. What are the factors that affect compressive strength of concrete?
4. What is effective flange width of RC beams as per IS code.
5. Write about IS code specifications to check limit state of cracking.
6. What do you understand by 'short term' and 'long term' deflections of RC beam.
7. Sketch stress distribution under isolated footings for cohesive and cohesion less soils.
8. What is the purpose of providing transverse reinforcement in columns?
9. Calculate minimum eccentricity of a column 4m unsupported length with section 230mm x 450mm as per IS code.
10. Find shear strength of M20 grade concrete section 230mm x 500mm overall depth which is reinforced with 1.0% of tension steel.

PART-B

Note : Answer any Four Questions **(4 x 15 = 60 Marks)**

11. Determine the flexural reinforcement required for a RCC beam of effective Dimensions 230 x 450 mm subjected to a working udl of 25 kN/m. The beam is simply supported at ends with a effective span of 5.2m. Draw neat sketch of reinf. Details. Use M20 grade concrete and Fe550 steel.

12. A rectangular beam 300 x 450mm effective depth is reinforced with tension steel of 4- Nos 16mm diameter. Determine the moment of resistance and check if the section is safe to resist a moment of 80 kNm. Use M20 grade concrete and Fe 500 steel. Use working stress method.

13. Design shear reinforcement for a beam 350 wide and 600 deep subjected to a Factored bending moment of 180 kNm, torsional moment of 20 kNm and a shear force of 150kN, by Limit state method. Use M25 grade concrete and Fe 500 steel.

14. Design a simply supported slab panel 4.2m x 6.5m which carries a super imposed load of 5 kN/m^2 at collapse. Use M20 grade concrete and Fe500 steel. Draw sketch showing reinforcement details.

15. (a) Give assumption made in analysis of slabs using yield line theory.
    (b) Explain with sketches the yield line patterns of one-way and two way slabs.

16. Design longitudinal reinforcement and ties for a short column of size 400x400mm subjected to an axial factored load of 2600 kN a factored moment of 20kNm about one axis. Assume M20 grade concrete and Fe 550 steel.

17. Write short notes on
    a. Stress block parameters of RC section.
    b. Curing of concrete
    c. Workability of concrete and its measurement.

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Code No : 2608/CBCS/BL

FACULTY OF ENGINEERING

B. E., V-Semester (CBCS)(EEE) (Main & Backlog) Examination, October 2020

Paper: Power system - II

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1) For a medium length nominal T transmission line draw the phasor diagram for lagging power factor conditions.
2) List out the applications of power circle diagrams?
3) Explain the basic working principle of Thyristor controlled reactor?
4) Four identical alternators each rated for 20 MVA, 11 KV having a sub transient reactance of 16% are working in parallel. Find the short circuit level at the bus bars.
5) Draw the connections of sequence networks for three phase to ground fault through an impedance Zr.
6) Explain the use of per unit quantities in power system?
7) Draw the vector diagram with the help of sequence components to obtain the phase voltages.
8) What is the need of tap changing transformers?
9) What is travelling Wave?
10) Explain why a traveling wave suffers reflection when it reaches a discontinuity?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) Derive expressions of sending end voltage and current for a nominal ∏ method and also draw phasor diagrams.
    b) Explain the factors affecting corona.

12. a) With the help of a neat diagram ,explain ther operation of a on load tap changing transformer
    b) Explain the operation of synchronous phase modifier ?

13. a) Three generators are rated as follows :
    Generator 1 -150 MVA,33 KV,Reactance 15%
    Generator 2 -180 MVA,32 KV,Reactance 12%
    Generator 3 – 120 MVA,30 KV,Reactance 18%
    Determine the Reactance of generators corresponding to base values of 300 MVA,35 KV.

    b) Find the value in ohms of the reactance per phase external to a 20 MVA,10 KV, 50 Hz, 3-phase generator such that the steady-state current on short circuit shall not exceed 8 times the full load current. The internal reactance of the generator is 5%

14. a) Obtain the formula for fault current in case of L-L-G fault in 3 phase abc phase sequence power system.
    b) a) A 3-phase,15 MVA,11 KV,50 Hz Alternator with solidly earthed neutral has sub transient reactance X^{11}_d of 20%,direct-axis transient reactance X^{1}_d of 25%

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and synchronous reactance Xd of 60%. Negative –sequence reactance X_2 = 20% and zero –sequence reactance X_0= 8%.The generator is operated on open circuit when fault occurs. Take Ea =1.0. If a fault is a three-phase short without an impedance, compute the initial symmetrical sub transient, transient and sustained rms values of the line current under faulty condition.

15. a) Three 10 MVA,6.6 KV, 3-phase star-connected alternators are operating in parallel. Each has Xd^{11} =15%, X_2 =12% and X_o =4.5%. If an earth fault occurs on one bus bar, determine the fault current when all the three alternators are solidly grounded.

    b) Obtain A, B, C &D parameters of medium transmission line in case of Nominal T method ?

16.a) Write short notes on Bewley lattice diagram.

    b) Explain the development of a travelling wave on an overhead line ?

17. a) Determine Symmetrical components of unsymmetrical phasors.

    b) A 3-phase, 220 kV, 50 Hz transmission line consists of 1.55 cm radius conductor spaced 2 meters apart in equilateral triangular formation. If the temperature is 40^{o}C and atmospheric pressure is 76 cm, calculate the corona loss per km of the line. Take m_o = 0.85.

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Code No: 2614/CBCS

FACULTY OF ENGINEERING

B.E. V – Semester (EIE) (CBCS)(Main) Examination, October 2020

Subject: Power Plant Instrumentation

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

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1) What is the main function of Boiler?
2) Draw the Block Diagram of thermal power plant.
3) Enumerate the elastic elements used as pressure sensors.
4) What is meant by shrinking in boiler?
5) What is the function of governing systems in turbine?
6) Explain the principle of d-aerator control.
7) Write short notes on condenser vacuum control.
8) Draw a line diagram for hydrogen generator cooling system.
9) Mention the reactor dynamics in Nuclear Power Plant.
10) Draw block diagram of Solar Power Plant Control.

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11. a) Explain the methods of feed water flow rate measurement.
    b) With a schematic diagram, explain the Piping and instrumentation drawing of Boiler and indicate all control loops that can be established without redundancy.
12. a) What is the piping system for smoke and dust monitor?
    b) Explain the turbine supervising with a neat diagram.
13. a) Explain furnace draft and excess control with relevant diagrams.
    b) Write short notes on A/F ratio control with diagrams.
14. a) What is the main purpose of heat exchangers in the Turbine monitoring and control? Explain its operation with neat diagram.
    b) Explain Lubricant oil temperature with suitable diagram.
15. a) Explain with the help of Block Diagram Hydro Electric Plant.
    b) Write short notes on importance of control rods in Nuclear plant.
16. a) With a neat diagram, Explain the ball and race pulverizing mill.
    b) Discuss the speed control of turbines.
17. Write short notes on the following:
    a) Sliding Pressure mode of control in TPP.
    b) Hydrogen generator cooling system.

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Code No: 2622/CBCS/BL

FACULTY OF ENGINEERING

B.E. V - Semester (CBCS) (ECE) (Backlog) Examination, October 2020

Subject : Linear ICs and Applications

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

PART –A

Note : Answer any Five Questions **(5x2=10 Marks)**

1. Write the characteristics of the ideal Op-amp. Draw the pin diagram of 741 Op-amp
2. What is meant by constant current bias? Explain its importance?
3. Draw the circuit of non-inverting amplifier and derive the expression for output voltage.
4. Explain the working of op amp as voltage to current converter.
5. Design a HPF at the cutoff frequency of 1 KHz and a pass band gain of 2.
6. Explain about the zero crossing detector. How it is used as sine wave to square converter?
7. Design a 1 KHz square wave generator using 555 timer for duty cycle, (i) 0.25 (ii) 0.5
8. Explain block schematic of PLL and list the applications of PLL.
9. Explain the current boosting concept in IC 723.
10. An 8 bit DAC has an output voltage range of 0-2.55v. Find its resolution.

PART-B

Note : Answer any Four Questions **(4 x 15 = 60 Marks)**

11. (a) What are the DC and AC characteristics of an operational amplifier? Explain any two of them in each category.
    (b) Explain the significance of frequency compensation in Op-amp using any two compensation techniques.

12. (a) What is an instrumentation amplifier? Explain and derive for output voltage. Mention any three applications of it.
    (b) The input to an op-amp differentiator circuit is sinusoidal voltage of 10 v peak and frequency 2000Hz determine Vo, if R=50KΩ & C=2μF.

13. (a) Draw and explain narrow band pass filter circuit. Derive its gain equation.
    (b) Design a wide band pass filter having f_l = 200 Hz, f_h = 4KHz with pass band gain of 2.

14. (a) Discuss about an Astable multi-vibrator using an op - amp and derive an expression for frequency of oscillations.
    (b) Calculate the frequency of oscillation of an IC 566 VCO for external components R_T= 6.8 KΩ, C_T = 470 pF. Assume other component values if necessary.

15. (a) Explain Analog to Digital conversion using dual slope type ADC
    (a) Explain briefly about 723 voltage regulator.

16. (a) Draw the circuit of Schmitt trigger using 555 timer and explain its operation.
    (b) Design and draw the triangular waveform generator using op-amp and explain its operation

17. Write short notes on
    (a) Sample and hold circuit (b) Weighted resistor DAC

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Code No. 2628/CBCS/BL

FACULTY OF ENGINEERING

B.E. (M/P/AE) V – Semester (CBCS) (Backlog) Examination,
October 2019
Subject: Dynamics of Machines

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

PART – A

Note: Answer any five questions. **(5X2 = 10 Marks)**

1. Differentiate between static force analysis and dynamic force analysis.
2. Define crank effort and crank-pin effort.
3. Mention the three elements of gyroscopic motion and how they are combined in balancing a four wheeler?
4. Differentiate between isochronous governor and sensitiveness of a governor.
5. What is the purpose of flywheel? How does it differ from that of a governor?
6. Why complete balancing is not possible in reciprocating engine?
7. List the effects of partial balancing of locomotives.
8. Determine the natural frequency of mass of 10kg suspended at the bottom of the two springs (of stiffness: 5N/mm and 8 N/mm in series.
9. Draw the schematic diagram of a free damped vibration system and write the governing differential equation of the system.
10. Explain the terms: i) critical damping coefficient ii) dynamic magnifier or magnification factor iii) logarithmic decrement.

PART – B

Note: Answer any four questions. **(4X15 = 60Marks)**

11. A horizontal gas engine running at 210rpm has a bore of 220mm and a stroke of 440mm. The connecting rod is 924mm long the reciprocating parts weight 20kg. When the crank has turned through an angle of 30^0 from IDC, the gas pressure on the cover and the crank sides are 500 KN/m^2 and 60KN/m^2 respectively. Diameter of the piston rod is 40mm. Determine: i) Turning moment on the crank shaft; ii) Thrust on bearing; iii) Acceleration of the flywheel which has mass of 8kg and radius of gyration of 600mm while the power of the engine is 22KW.
12. The turbine rotor of a ship has a mass of 20 tonnes and a radius of gyration 0.75. Its speed is 2000 rpm. The ship pitches 6^0 above and below the horizontal position. One complete oscillation takes 18 seconds and the motion is simple harmonic. Determine (i) the maximum couple tending to shear the holding down bolt of the turbine (ii) the maximum angular acceleration of the ship during pitching (iii) the direction in which the bow will tend to turn while, if the rotation of the rotor is clockwise when locking from rear.
13. The controlling force is a spring controlled governor is 1500N when radius of rotation is 200mm and 887.5N when radius of rotation is 130mm. The mass of

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each ball is 8kg. If the controlling force curve is a straight line, then find (i) Controlling force at 150mm radius of rotation (ii) Speed of the governor at 150mm radius (iii) Increase in initial tension so that governor is isochronous (iv) Isochronous speed.

14. A punching machine carries out 6 holes per minute. Each hole of 40 mm diameter is 35 mm thick plate requires 8 N-m of energy/mm^2 of the sheared area. The punch has a stroke of 95 mm. Find the power of the motor required if the mean speed of the flywheel is 20 m/s. If total fluctuation of speed is not to exceed 3% of the mean speed, determine the mass of the flywheel.

15. A four cylinder vertical engine has cranks 300mm ling. The plane of rotation of the first, third and fourth cranks are 750mm, 1050 mm and 1650 mm respectively from that of the second crank and their reciprocating masses are 10kg, 400kg and 250kg respectively. Find the mass of the reciprocating parts for the second cylinder and relative angular position of the cranks in order that the engine may be in complete balance.

16. A steel shaft 100 mm in diameter is loaded and support in shaft bearing 0.4 m apart. The shaft carries three loads: first mass 12 kg at the centre, second mass 10 kg at a distance 0.12 m from the left bearing and third mass of 7 kg at a distance 0.09 m from the right bearing. Find the value of the critical speed by using Dunkerley's method. $E = 2X10^{11} N/m^2$.

17. A single cylinder oil engine derives directly a centrifugal pump. The rotating mass of the engine, flywheel and the pump with the shaft is equivalent to a three rotor system as shown in Fig.1. The mass moment of inertia of the rotors A, B and C are 0.15, 0.3 and 0.09 kg-m^2. Find the natural frequency of the torsional vibration. The modulus of rigidity for the shaft material is 84 kN/mm^2.

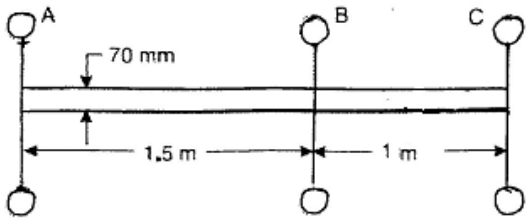

Fig.1

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Code No. 2639/CBCS

FACULTY OF ENGINEERING

B.E. (CSE) V- Semester (Backlog) Examination, October 2020

Subject: Database Management Systems

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

PART – A

Note: Answer any five questions. **(5X2 = 10 Marks)**

1. Define two-tier and three tier architecture.
2. What are the benefits of Database Views?
3. Write Syntax and Example on SELECT command with all optional clauses.
4. Discuss String Operations with suitable example in SQL.
5. What is Referential Integrity? Give example in SQL.
6. Differentiate between Procedures and Functions in Database.
7. Draw and Explain transaction states.
8. What are the advantages of B+ trees over B-trees
9. What are the different recovery algorithms?
10. Define multiple Granularity?

PART – B

Note: Answer any four questions. **(4X15 = 60Marks)**

11. a) Explain the concept of Generalization, Specialization and Aggregation with an Example
    b) Explain Database Users and Administrators.
12. a) Explain Set Operations and NULL values with suitable SQL queries.
    b) Explain Additional Relational-Algebra Operations with suitable example.
13. a) Explain all Integrity Constraints with each example in SQL.
    b) Discuss all Normal Forms based on Functional Dependencies.
14. a) Insert the following keys in a B+ tree for the order n mentioned below
    i) n=3 ii) n=5
    4 7 13 16 21 24 29 32 37 41 45 49 5
    b) Explain recoverable schedules and cascadeless schedules.
15. a) What is locking in DBMS? Explain lock based protocol.
    b)Explain validation based protocol.
16. a) Explain Deadlock prevention strategies in transactions.
    b) What are the differences between Dense Indexing and Sparse Indexing?
17. Write short notes on
    a) Trigger Syntax with example in SQL
    b) Buffer Management.
    c) ARIES algorithm

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Code No. 2648/CBCS/BL

FACULTY OF ENGINEERING

B.E. (IT) V – Semester (CBCS) (Backlog) Examination, October 2020

Subject: Software Engineering

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

PART – A

Note: Answer any five questions. **(5X2 = 10 Marks)**

1. List any three practitioner's Myths.
2. List the phases in unified process.
3. Define data objects with an example.
4. Write about validating requirements.
5. Define coupling and cohesion.
6. What is Information sliding?
7. What is UML and where can it be used?
8. Write any four principles of modeling.
9. What is Alpha test and Beta test?
10. Define SQA.

PART – B

Note: Answer any four questions. **(4X15 = 60Marks)**

11. (a) Discuss any tow Agile process models.
    (b) Draw a class diagram for a student registering for course in a University.

12. Discuss concept, advantages, limitations of waterfall and incremental model.

13. (a) Explain about scenario based model.
    (b) Write about elements of SQA.

14. Consider an example of withdrawal of cash from ATM. Draw 0-level and first-level dataflow diagram. Make necessary assumptions.

15. (a) Explain about use cases and use case diagram with example.
    (b) What is forward and reverse engineering?

16. Explain about architectural styles in detail.

17. What is white box testing? Explain in detail the methods in white box testing.

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