Code No.2560/CBCS/BL

FACULTY OF ENGINEERING

B. E. (Civil) (CBCS) IV – Semester (Backlog) Examination, October 2020

Subject: Hydrology & Water Management

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

PART – A

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

1. A 6 hour storm on a drainage area 360 sq.km. with total runoff 1240 cumecs. Compute the depth of rainfall excess.
2. A catchment which has 364 Sq.Km. area has 6 hour unit hydrograph of a storm which can be approximated by a triangle. If its time base is 60 hours and peak value of 60 cumecs compute the effective rainfall for the storm.
3. Compare the terms ”Flood” and “Runoff” in a basin.
4. What is Aquifer? Give three soils best suitable for good aquifer.
5. Determine the radius of influence when draw down is restricted to 4m and coefficient of permeability is 0.018 m/sec.
6. A road culvert was designed to pass a flood of 25 years recurrence interval. Determine the Probability that it will overtopped exactly 4 times over next 4 years.
7. Define Reference Evapo-transpiration term.
8. What do you understand by Yield from basin?
9. State the concept of soil moisture tension.
10. Distinguish between Temporary Wilting point and Permanent wilting point.

PART – B

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

11. (a) Explain the different types of Precipitations and their impact on Monsoon in India generally.

    (b) The data indicated below in table corresponds to a catchment. Find the average depth of annual precipitation over the basin using Arithmetic Method and Isohyetal method.

Isohyets	65-75	75-85	85-95	95-105	105-125	125-145
Area enclosed Sq. Km.	80	140	1820	2460	3000	3150

12. (a) Given below are the ordinates of a 3 h unit hydrograph of a basin in $m^{3/s}$ with rainfall of 2 cm, 3 cm and 1.5 cm during 3 hours of interval. Derive and plot Flood Hydrograph assuming a base flow of 15 cumecs.

Hours	0	3	6	9	12	15	18	21
Ordinates of Unit Hydrograph (Cumecs)	0	60	180	340	420	330	220	170
Hours	24	27	30	33	36	--	--	--
Ordinates of Unit Hydrograph (Cumecs)	120	70	40	10	0	--	--	--

(b) What do you understand by a flood? Derive Gumbel's extreme value method of estimating flood.

13. (a) Explain concept of Darcy's law with the aid of sketch. Derive the expression for steady state radial flow discharge into a confined aquifer. State the assumptions made.

(b) Design a tube well to provide an yield of 14 cumecs of water with a coefficient of Permeability 90 meters per day. The draw down is limited to 6 meters in the area. The thickness of aquifer is 42 meters and the radius of influence is 320 meters.

14. (a) The annual runoff of a stream is found to follow Normal Distribution with mean 5400 cumecs and Standard deviation of 1400 cumecs. Determine the probability that it's value in any year is more than 8600 cumecs. Also determine the range symmetrical bout the mean with which it's value of probability is exactly 0.5.

(b) Enumerate the different methods of flood estimation. Explain in detail flood frequency analysis.

15. (a) What do you understand by Duty and how it is useful. State various factors that affect Duty.

(b) Estimate after how many days irrigation is necessary to ensure healthy growth of crop with the following data.
(i) Field capacity of crop=36%
(ii) Permanent Wilting Point=14%
(iii) Density of soil=1200 kg/m^3
(iv) Effective Root depth=740mm
(v) Daily consumptive use of water=12 mm.
Assume for health growth of crop moisture should not fall below 25% of water holding capacity.

16. (a) Explain the constant level pumping test importance and derive expression for safe yield based on this test.

(b) What is flood and explain various empirical methods with relevant expressions to compute the floods.

17. Explain the following:
(a) Stream Gauging.
(b) Recuperation Test.
(c) Vertical distribution of soil water.

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Code No. 2567 / CBCS / BL

FACULTY OF ENGINEERING

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

Subject: Electrical Circuits – II

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

PART – A

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

1 List the properties of Fourier analysis.

2 Define line spectra and phase angle spectra.

3 Find the Laplace transform ramp and exponential decaying functions.

4 Find the Laplace transform of the function $F(t) = 4t^3 + t^2 - 6t + 7$.

5 Write down the Z parameters in terms of ABCD parameters.

6 Give the expressions for symmetry and reciprocity in case of transmission parameters.

7 What is a positive real function?

8 Define Tie-set and Cut-set.

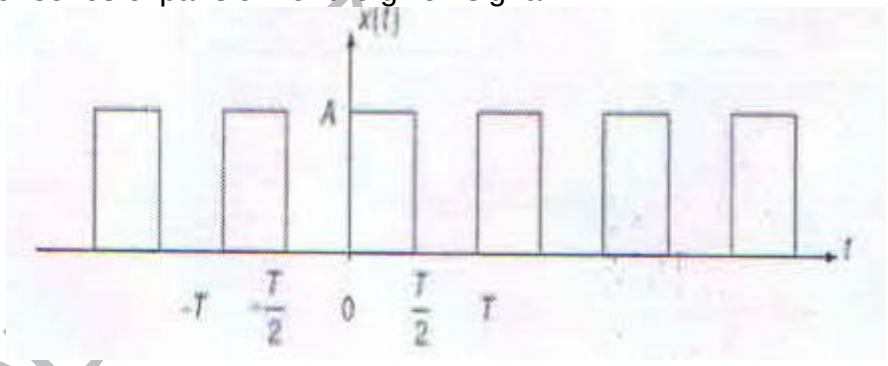
9 Write the properties of foster first and second forms.

10 Draw the first cauer form of RL representation.

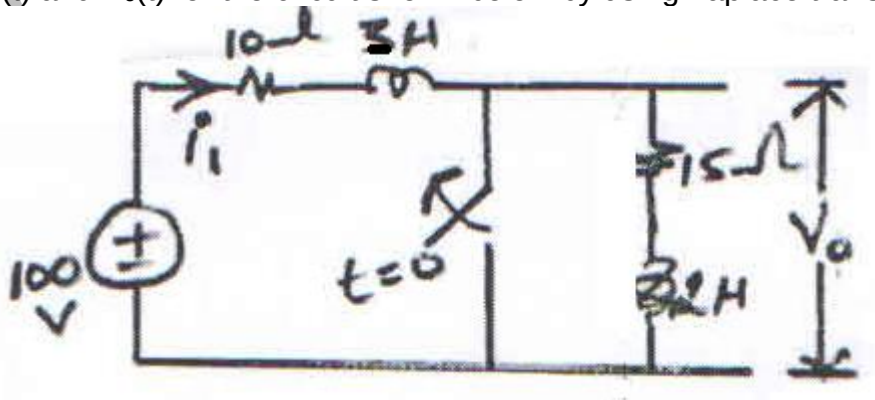
PART – B

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

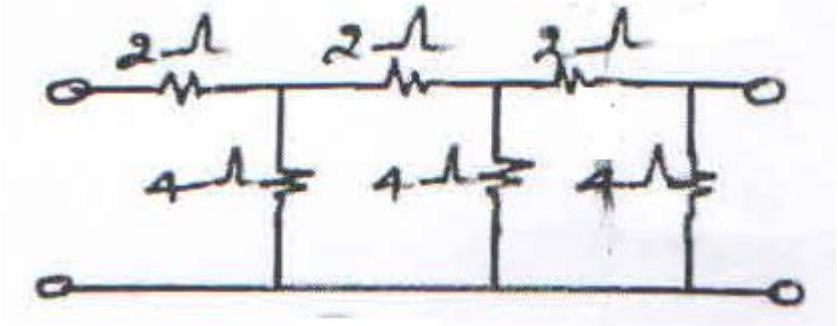
11 Find the Fourier series expansion for the given signal.



12 Determine the i(t) and $V_o(t)$ for the circuit shown below by using Laplace transform.



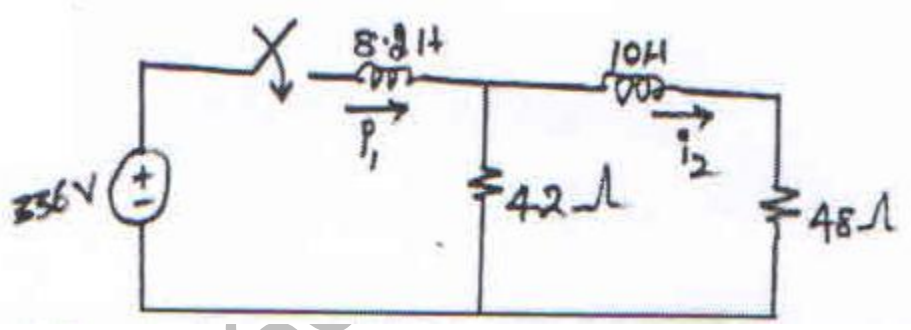
13 Find the ABCD parameters of the network shown in



14 Test the given functions for positive real property $F(s) = \frac{5s^2 + 18}{s(s^2 + 9)}$, $F(s) = \frac{s^2 + 8}{s(s^2 + 2)}$.

15 Synthesize the first foster form of the $z(s) = \frac{s(s^2 + 10)}{(s^2 + 4)(s^2 + 16)}$.

16 Obtain the expression for i_1 and i_2 in the circuit shown below, when dc voltage source is applied suddenly. Assume that the initial energy stored in the circuit is zero.



17 Determine the inter relation between ABCD parameters and y-parameters.

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Code No: 2570/CBCS/BL

FACULTY OF ENGINEERING

B.E. IV-Semester (CBCS) ((Inst.) (Backlog) Examination, October 2020

Subject : Electrical Machines

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

PART –A

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

1. Write types of excitations of dc generator.
2. Why Dc motor cannot be run without starter?
3. Draw the exact equivalent circuit of transformer under no load and load.
4. Explain the principle of operation of transformer.
5. Calculate the distribution factor for 36-slots, 4-pole, single layer three phase winding.
6. Write applications of synchronous motor.
7. A 3ϕ - slip ring induction motor runs at 290 rpm at full load, when connected to 50Hz supply. Determine the number of poles and slip.
8. Write applications of induction motors.
9. Draw the circuit diagram of single phase motor and with phasor diagram?
10. Write any two difference between variable reluctance stepper motor and permanent magnet stepper motor.

PART-B

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

11. a) Draw characteristics of shunt, series and compound motors?
    b) A 240V series motor takes 40 ampers when giving its rated output at 1500 rpm. Its resistance is 0.3 ohm. Find what resistance must be added to obtain rated torque i) at starting ii) at 1000rpm.
12. With a neat diagram explain the speed control techniques of D.C. shunt motors.
13. The efficiency of a 1000-KVA, 110/220^{V}, 50-HZ, 1- ø transformer is 98.5% at half full load at 0.8pf leading and 98.8% at full load unity power factor Determine its i) Iron loss ii) full load copper loss and iii) maximum efficiency at unity pf.
14. a) Write a short notes on effect of excitation on armature current and power factor with relevant diagrams?
    b) A 3-ø, 6600V, 50Hz, star connected synchronous motor takes 50A current. The resistance and synchronous reactance per phase are 1Ω and 20Ω respectively. Find the power supplied to the motor and induced emf for power factor of 0.8 lag?
15. a) A 3-ø, 400/200^{V} Y-Y connected wound rotor induction motor has 0.06Ω rotor resistance and 0.3Ω stand still resistance per phase. Find the additional resistance required in the rotor circuit to make the starting torque equal to the maximum torque of the motor?
    b) Draw and explain the torque slip characteristics of 3- ø induction motor?
16. Explain the following speed control of 3-induction motors with neat diagrams?
    a) Rotor rheostat control
    b) Cascade operation
17. Write about construction and working of permanent magnet stepper motor with all steps of operation and relevant diagrams.

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Code No. 2576/CBCS/BL

FACULTY OF ENGINEERING

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

Subject: Electromagnetic Theory & Transmission Lines

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

PART – A

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

1. Convert point P(2, 4 , 6) from Cartesian to spherical coordinates.
2. Define electric Potential.
3. In cylindrical co-ordinates B=2.0/r $a_{\emptyset}$ Tesla. Determine the magnetic flux (Ø) crossing the plane surface defined by 0.5≤r≤2.5 m and 0≤z≤2.0 m.
4. State Ampere's law.
5. Define wavelength. What is the relationship among wavelength, frequency and phase velocity?
6. What is total Internal Reflection?
7. What is the reflection co-efficient and VSWR of short-circuited transmission lines?
8. What is the condition for a line to be distortion-less ?Define various types of distortions.
9. A lossless transmission line with a characteristics impedance of 400Ω is terminated in a resistive load of 200Ω.Determine the percentage of reflected power.
10. What are the applications of Smith chart?

PART – B

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

11. (a) State and explain coulomb's law. Obtain an expression in vector form.
    (b) Two uniform line charges of density 8 nC/m are located in a plane with y=0 at x =±4 m.Find the E-field at a point P (0m, 4m, 10m).

12.(a) Find the magnetic field Intensity at the center of circular loop of radius "a" carrying current (I) along φ in z=0 plane.
    (b) Define magnetic vector potential. Given $\vec{A} = -\frac{\rho^2}{4}\widehat{a_z}$ wb/m. Calculate the total magnetic flux crossing the surface 1 ≤ρ ≤ 2m , 0 ≤2 ≤ 5m.

13.(a) State and Prove Poynting theorem.
    (b) In a medium $E = 16e^{-x/20}\sin(2\times10^8 t - 2x)\,\widehat{a_z}$v/m. Find the direction of propagation the propagation constant, wavelength , speed of the wave & skin depth.

14.(a) With a neat diagram, derive the general transmission line equations.
    (b) Show that λ/4 line acts like impedance inverter.

15.(a)7m lossless line with Z_o = 75 Ω is terminated in an impedance. Z_R = 115-j80Ω. The wavelength of transmission line is 2.5m.Using the Smith chart, find reflection co-efficient, SWR and input impedance .
    (b) Compare single stub matching with double stub matching.

16. (a) Derive the expression for Poisson's and Laplace's equation.
    (b) Derive the conductor –dielectric boundary conditions in static electric field.

17.Write short notes on:
    (a)Linear, elliptical and circular polarizations
    (b)Loading of a line

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FACULTY OF ENGINEERING

B.E. (M/P/AE) IV-Semester (CBCS) (Backlg) Examination, October- 2020

Subject : Kinematics of Machines

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

PART – A

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

1 Define the terms: mechanism, structure and machine.
2 Give the classification of kinematic pairs and chains.
3 Define Kennedy's theorem
4 Show the magnitude and direction of Coriolis components of acceleration.
5 Differentiate uniform pressure and uniform wear criteria used in friction problems.
6 Give the classification of brakes and dynamometers.
7 Give the classification of cam-followers and their motions.
8 Define contact ration in gears and show its expression.
9 State fundamental law of gearing.
10 Show epicyclic gear train arrangement and give its relative velocity ratio.

PART – B

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

11 Explain clearly the inversions of double slider crank chain with applications.

12 In the engine mechanism, crank and connecting rod lengths are 50 mm and 250 mm respectively. The center of gravity of connecting rod lies at 100 mm from crank pin. When the crank is at 45^0 form IDC while rotating in clockwise direction at 500 rpm, find the velocity of slider and velocity of C.G of connecting rod. Also find the angular velocity of connecting rod.

13 A leather belt 150 mm wide and 10 mm thick transmits power from a pulley of 1m diameter, which runs at 500 rpm. The angle of lap is 160^0 and μ =0.3. The mass density of the belt material is 1000 kg/m^3 and maximum permissible stress is 3 MPa. Find the maximum power that can be transmitted.

14 A cam is required to move a roller follower with SHM on both outward and return strokes. The angle of ascent, dwell and descent are 120^0, 60^0 and 90^0 respectively. The follower dwells for rest of the cam rotation. Minimum radius of cam is 50 mm and the follower lift is 40 mm and the roller diameter is 10 mm. Draw the cam profile. Find the maximum velocity and acceleration of the follower during ascent and descent when the cam rotates at 200 rpm.

……..2

15 Two matting gears of 200 pressure angle have 20 and 40 involute teeth of module 10 mm. If the addendum of each wheel is such that the path of contact is maximum and interference is just avoided. Find the addendum of each gear. Also find contact ration.

16 Two parallel shafts are to be connected by spur gearing with approximate center distance of 600 mm. if one shaft runs at 120 rpm and the other at 360 rpm, find the number of teeth on each wheel, if the module is 8 mm. Also determine the exact center distance.

17 Write short notes on the following with figures

a) pantograph.

b) friction axis and friction circle.

c) epicyclic gear train.

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FACULTY OF ENGINEERING

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

Subject :Programming Languages

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

PART – A

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

1. Define Syntax and Semantics with an example.
2. List reasons for studying concepts of programming languages.
3. What are the primitive data types.
4. What are Arthimetic expressions.
5. What are the general subprogram characteristics.
6. Define subprogram definition, subprogram header,formal parameter and actual parameter.
7. What is Data Abstraction.
8. Define the term liveness,Deadlock,Rendezvous.
9. What is lamda expression.
10. What are functional forms.

PART – B

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

11.a) Explain about Compilation and Pure Interpreter .

b) Discuss about programming domains.

12.a) Derive the equation A=B+C*A for the below Unambiguous Grammer and also draw the parse tree for below

<assign> → <id> = <expr>
<id> → A | B | C
<expr> → <expr> + <term>.
| <term>
<term> → <term> * <factor>
| <factor>
<factor> → (<expr>)
| <id>

b) Explain Short-Circuit Evaluation.

13.a) Discuss about Selection statements.

b) Discuss about Assignment statements.

14.a) Discuss about parameter-passing methods .

b) Discuss User-Defined Overloaded Operators.

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15.a) Explain the Abstract Data Types in Java with example.

b) Explain about Support for Object-Oriented Programming in C++.

16.a) Briefly Explain about the fundamentals of Functional programming language.

b) Differentiate between imperative and functional programming languages.

17.a) What are the applications of Functional Languages.

b) Draw the internal representation of two LISP using single-linked lists of (A B C D) and (A (B C) D (E(F G)))

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Code No: 2596/CBCS/BL

FACULTY OF INFORMATICS

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

Subject: Data Communications

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

PART – A

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

1. Explain modulation. Name three modulation techniques.
2. Name three functions of Data link layer
3. What is the purpose of CRC and mention the rules of Cyclic redundancy code
4. What is the main difference between Asynchronous and Synchronous transmission?
5. Explain the concept of Multiplexing.
6. What is the difference between 'Go-back n' and selective repeat/reject protocols?
7. Explain Simplex, Half and full Duplex communication.
8. What is the purpose of MAC layer?
9. What is the main advantage of Cellular networks?
10. Mention two differences between 1G, 2G and 3G systems.

PART – B

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

11. Draw layer wise ISO -OSI Reference model and explain the functions of each layer.
12. What is flow control? Explain different protocols used in flow control mechanism.
13. Explain different types of guided transmission media with applications of each.
14. Explain the characteristics of ATM protocol. Draw and explain its frame format.
15. What is Ethernet? Mention different types of Ethernet and its characteristics.
16. Explain the concept of cellular networks. Compare the three generations of cellular networks.
17. Write the short notes on two of the following:
    a) Transmission impairment
    b) Bluetooth
    c) Data encoding: Digital data – analog signals.

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Code No. 2048/BL

FACULTY OF ENGINEERING

B.E. 2/4 (Civil)) II – Semester (Backlog) Examination, October 2020

Subject: Electrical 'technology (Part – A)

Time: 2 Hours **Max.Marks: 38**

PART – A

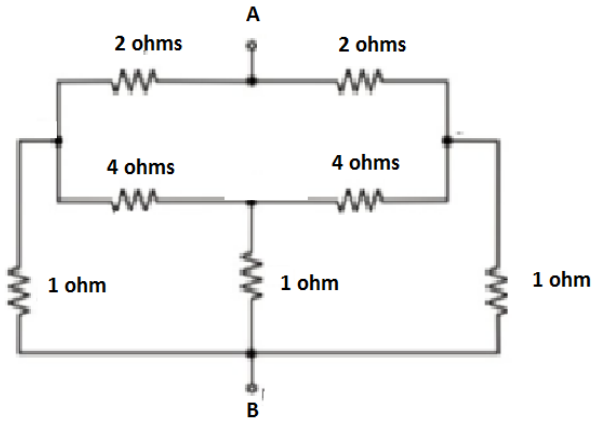
Note: Answer any five questions. **(5x2 = 10 Marks)**

1. Explain the following terms 'resistance', 'reactance' and 'capacitance'.
2. How do you convert a delta to a star connection?
3. Draw the equivalent circuit of a transformer.
4. What is slip and write its expression. How does the slip vary with load?
5. List out the applications of induction motor.
6. Draw the vector diagram for a load transformer for capacitive load.

PART – B

Note: Answer any two questions. **(2x14 = 28 Marks)**

7 a) Determine the equivalent resistance between the terminals *A and B* of network shown in below figure.



b) A 3 phase unbalanced Y-connected load of Za = (2 + j2), Zb = (3 + j5) and Zc = (3 – j9) is put across a 3-phase, 200-V circuit with balanced voltages, find the three line currents and voltages across each branch impedance. Assume phase sequence of Vab, Vbc, Vca.

8. a) Explain the constructional details of squirrel cage induction motor.

b) Find (i) active and reactive components of no load current and (ii) no load current of a 440/220V single phase transformer if the power input on no load to the high voltage winding is 80W and power factor of no load current is 0.3 lagging.

9. a) The power input to the rotor of a 3-phase, 50 Hz, 6 pole, slip ring induction motor is 40 KW and the motor runs at 1000 rpm. The rotor resistance per phase is 0.25 ohms. Determine the value of the rotor current per phase.

b) Calculate the r.m.s. value, the form factor and peak factor of a periodic voltage having the following values for equal time intervals changing suddenly from one value to the next : 0, 5,10, 20, 50, 60, 50, 20, 10, 5, 0, −5, −10 V etc. What would be the r.m.s value of sine wave having the same peak value?

10 a) Prove that average power consumption in pure capacitor is zero when a.c. voltage is applied.

b) The power supplied to a three-phase induction motor is 32kW and the stator losses are 1200W. If the slip is 5 per cent, determine (a) the rotor copper loss, (b) the total mechanical power developed by the rotor, (c) the output power of the motor if friction and windage losses are 750W, and (d) the efficiency of the motor, neglecting rotor iron loss.

11. a) With necessary diagrams explain in detail about polar curves.

b) Derive e.m.f equation of a single phase transformer

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Code No: 2049/BL

FACULTY OF ENGINEERING

B.E. 2/4 (Civil) II – Semester (Backlog) Examination, October 2020

Subject: Mechanical Technology (Part – B)

Time: 1 Hours **Max.Marks:37**

Note: Answer any two Questions from Part-A & any two questions from Part-B.

PART – A (12 Marks)

1 What do you understand by Earth Compactor?
2 What is a Rock Drill?
3 Write uses of Concrete Pump.
4 Explain Aerial Ropeway.
5 Write the uses of Grader.

PART - B (25 Marks)

6 (a) Differentiate between Clam Shell and Cable Excavator.
(b) Write the advantages, disadvantages and uses of Earth Compactor.

7 (a) Explain in detail a Construction Elevator.
(b) Write note on Concrete Mixer and Concrete Pump.

8 (a) Writer about Crusher's Jaw.
(b) What are the uses of Shaking and Vibrating Screen?

9 Write the working principle and uses of Reciprocating Air Compressor with neat sketch.

10 Write a note on.
(a) Scraper.
(b) Apron Conveyor.
(c) Pneumatic Jack Hammer.

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Code No: 2054/BL

FACULTY OF ENGINEERING

B.E 2/4 (EEE) II-Semester (Backlog) Examination, October 2020

Subject : Electrical machines-I

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

PART –A

Note : Answer any Seven Questions **(7x3=21 Marks)**

1. Define field energy & Co-energy
2. Bring an analogy between lap & wave winding
3. Mention the various causes of failure of build of voltage in DC shunt generators
4. What would happen if the DC. motor is directly switched on to the supply, without any starter?
5. Define back EMF & what is the significance of it in DC motor
6. Mention the various losses in DC machine
7. Hopkinson's test is called regenerative test. Why?
8. What is O.C.C ? Sketch & Explain the nature of O.C.C
9. Draw the phasor diagram of transformer on Load at lagging p.f
10. It is desired to have a 4.13 mWb maximum core flux in a transformer at 110V and 50Hz. Determine the required number of turns in the primary.

PART-B

Note : Answer any Three Questions **(3 x 18 = 54 Marks)**

11 a) Derive the EMF equation of D.C generator from fundamentals & explain why lap winding is preferred for low voltage high currents?

b) A 100KW ,250V DC shunt generator has 4 poles , lap connected armature with 280 conductors .The generator is rewound to form armature circuits with wave connected armature for the same number of conductors .Calculate the new rating of the machine for voltage, current & power if the speed & flux per pole remain same as before

12 a) What are the important characteristics of D.C motors & sketch all the characteristics of D.C series motors & why is it necessary to study them

b) A 200V shunt motor has Ra= 0.1Ω & Rf= 240Ω & rotational losses are 236W. On full load the line current is 9.8Awith motor running at 1450rpm .Determine

a) mechanical power developed b) Power output
c) Load torque d) full load efficiency

13 a) Draw the winding diagram of 4 pole, 12 slot simplex lap connected DC generator with commutator having 12 commutator segments.

b) A 120 V d.c. shunt motor having an armature circuit resistance of 0.2 n and field circuit resistance of 60 Ω, draws a line current of 40 A at full load. The brush volt drop is 3 V and rated full-load speed is 1800 rpm. Calculate.

(a) Speed at $\frac{1}{2}$ load.

(b) Speed at overload of 125%.

…2

14 a) Explain the process of voltage build up in D.C shunt generator. What is critical field resistance ?

b) A 460 V series motor runs at 500 r p m taking a current of 40A. Calculate the percentage change in torque if the load is reduced so that the motor is taking 30A. Total resistance of the armature and field circuit is 0.8 Ω. Assume flux and field current to be proportional.

15 The Following data were obtained on a 20 KVA, 50 Hz, 2000/200 V distribution 1-phase transformer.
O.C. test (H.V. opened) : 200 V 4A 110W
S.C. test (L.V. shorted) 50 V 10A 290W
Draw the appropriate equivalent circuit of the transformer referred to H.V and L.V. sides. Calculate efficiency and regulation at full load and half load. Assume p.f. 0.8 lagging.

16 Two coupled coils have self and mutual inductance of
L11= 2 +1/2x
L22 = 1+1/2x
L12 = L21 =1/2x
Over a certain range of linear displacement x. The first coil is excited by a constant current of 20A, and the second by a constant current of -10 A.Find
(a) Mechanical work done if X charges from 0.5 to 1m
(b) Energy supplied by each electrical source
(c) Change of field energy

17 Explain the following tests with help of neat schematic diagrams:
(a) Polarity test (1 – phase transformer)
(b) Retardation test (DC machine)

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Code No.2058/BL

FACULTY OF ENGINEERING

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

Subject: Electrical Machines

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

PART – A

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

1. How are DC Machines classified?
2. What are the losses that will occur in a DC machine?
3. Draw the equivalent circuit of a 1-Φ transformer?
4. What is the main advantage of laminating the core of a transformer?
5. What are the advantages of a slip ring over a squirrel cage induction motor?
6. A 4-pole, 3-Φ induction motor is running on a 60 Hz supply. If it is operating at a slip of 5%, what is the speed of the motor?
7. Write briefly the various methods of starting a synchronous motor.
8. Explain how synchronous motor improves power factor.
9. Explain why single phase induction motor is not self-starting.
10. List the applications of various stepper motor.

PART – B

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

11. (a) Derive the torque equation of a DC motor.

    (b) A 400V DC shunt motor takes 5 Amps at no load. If armature, field resistances are 0.5Ω & 200Ω respectively. Find the efficiency of the motor when it takes 50 Amps at full load. Find also the percentage change in speed from no load to full load.

12. (a) Draw the load characteristics of DC generators. Write the applications.

    (b) A 250V DC long shunt compound generator supplying a load of 25KW at rated voltage. The resistances of its armature, shunt and series winding are 0.1, 50, 0.06 ohms respectively. Find the induced EMF and the armature current. (Neglect other losses).

5

13. (a) Derive an expression for an EMF equation of a transformer.

    (b) Explain in detail about three phase transformer connections.

14. (a) Explain in detail the principal of operation of 3-Ø Induction motor.

    (b) Explain star delta starting method for a 3-Ø Induction motor.

…..2

15. (a) Explain the effect of excitation with respect to Power factor in a synchronous motor.
    (b) Derive the EMF equation of a synchronous generator.
16. Explain how to make 1-Ø induction motor a self-starting motor and discuss different types of 1-Ø induction motor.
17. Write short notes on any *two* of the following:
    (a) Necessity of starter in a DC motor.
    (b) Scott Connection.
    (c) Double field revolving theory.

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Code No. 2062 / BL

FACULTY OF ENIGNEERING

B.E. 2/4 (ECE) II – Semester (Backlog) Examination, October 2020

Subject: Signal Analysis and Transform Techniques

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

PART – A

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

1 Define unit impulse signal and write its properties

2 Distinguish between causal and non-causal signal and $x(t)=e^{t}u(t-2)$ is causal or not

3 What is Fourier Spectrum?

4 Find the Fourier transform of $e^{-at}u(t)$?

5 Differentiate Laplace Transform and Fourier Transform?

6 What is convolution?

7 State initial value theorem and final value theorem in Z-Transform

8 What are the advantages and limitations of Z-Transform

9 Write the advantages of sampling the Z-Transform?

10 State any two properties of linear convolution?

PART – B

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

11 a) Check $y(t)=at^2x(t)+btx(t-4)$ is static or dynamic, linear or Non-linear, causal or Non-causal and Time variant or Time Invariant.

b) Find whether the signal is energy or power signal

$$X(t)=\begin{cases} t-2, for -2 \le t \le 0 \\ 2-t, for\ 0 \le t \le 2 \\ 0,\ otherwise \end{cases}$$

12 a) A rectangular function is defined as x(t) shown in below. Approximate the x(t) by Acos(t) between intervals [0,2π] such that the mean square error is minimum.

$$X(t)=\begin{cases} A, for\ 0 < t < \frac{\pi}{2} \\ -A, for \frac{\pi}{2} < t < \frac{3\pi}{2} \\ A, for \frac{3\pi}{2} < t < 2\pi \end{cases}$$

b) State and Prove Time shifting property and Frequency shifting property of Fourier Transform.

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13. Obtain the convolution of the following two signals by graphical method

$$X(t)=\begin{cases}1, for -3 \le t \le 3\\ 0, elsewhere\end{cases} \qquad h(t)=\begin{cases}2, for\ 0 \le t \le 3\\ 0, elsewhere\end{cases}$$

14 a) Find the Z-Transform and ROC of X(z) for

$$x(n)= \left(\frac{1}{4}\right)^n \cos\left(\frac{\pi}{3}n\right) u(n)$$

b) Find the inverse Z-Transform of $X(z)= \frac{2z-7}{z^2-5z+6}$

15 a) State and prove Properties of correlation.

b) Determine the Fourier series representation of the discrete sequence $x(n)= \cos\frac{\pi}{3}n + \sin\frac{\pi}{4}n$.

16 a) What are the basic operations on signals? Illustrate with example.

b) Derive the expression for Fourier Transform from Fourier series.

17 a) Compare Laplace transform and Z-Transform.

b) State and prove time convolution theorem in Laplace Transform.

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Code No. 2068/BL

FACULTY OF ENGINEERING

B.E. 2/4 (M/P/AE) II-Semester (Backlog) Examination, October 2020

Subject : Kinematics of Machines

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

PART – A

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

1 State the Grubler's criterion of planer mechanism.

2 What is Pantograph. Show the line diagram.

3 Sketch slider crank mechanism and show all the I centres.

4 State Kennedy's theorem of I centres.

5 State the applications of uniform pressure and uniform wear criterion.

6 State the functions of dynamometer. Give its classification.

7 Give the classification of cams and followers.

8 Write the conditions for maximum power transmitted by the belt drive.

9 Show the classification of gear drives.

10 Sketch reverted gear train. State its applications.

PART – B

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

11 Explain with neat figures the inversions of double slider crank chain.

12 In a slider crank mechanism, the crank and connecting rod are 200 mm and 800 mm long respectively. Crank rotates clockwise at 360 rpm. Determine the slider velocity and angular velocity of connecting rod at 45° angular position of crank from IDC.

13 The shaft of a collar thrust bearing rotates at 200 rpm and carries an axial thrust of 10 tons. The outer and inner diameter of bearings are 480 mm and 280 mm respectively. If the power lost in friction is not to exceed 8 Kw, determine the coefficient of friction at the bearing surface.

14 The roller follower of 10 mm diameter is driven by a radial cam. Follower raises through 40 mm with SHM during 120° of cam rotation. Follower descends with uniform acceleration and retardation during the 120° of cam rotation. Follower dwells at the end of ascent and descent through 60° each of cam rotation. Design the cam profile with minimum cam diameter of 50 mm.

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15 Two 20° involute spur gears have a velocity ratio of 2.5 and mesh externally. The module is 4 mm and the addendum is equal to 1.23 module. The pinion rotates at 150 rpm. Find
   I. Minimum number of teeth on each wheel to avoid interference.
   II. Number of pairs of teeth in contact.
   III. Maximum sliding velocity.

16 A flat belt transmits 8 Kw of power from a pulley of 1.1 metres diameter that rotates at 200 rpm. The angle of contact is 160°. Coefficient of friction between belt and pulley is 0.25. Permissible working stress in the belt is 2.5 N/mm^2. Belt thickness is 6 mm and its density is 1100 kg/m^3. Find the width of the belt.

17 Write short notes of any two of the following.
   (a) Straight line motion mechanism.
   (b) Comparison between involute and cycloidal gear tooth profiles.
   (c) Classification of gear trains.

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Code No. 2075/BL

FACULTY OF ENGINEERING

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

Subject: Principles of Programming Languages

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

PART – A

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

1. Write the typical activation record for an ALGOL like language.
2. Write in brief about Haskel.
3. What is Type inference? List any two languages supporting it.
4. Compare between writability and reliability.
5. What is user defined ordinal types.
6. What is lazy evaluation?
7. State the disadvantage of explicit heap dynamic variable.
8. What is implicit, explicit type conversion?
9. State the importance of finally clause in java.
10. State the evaluation of axiomatic semantics.

PART – B

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

11. Write about LISP in detail and applications of functional programming languages.
12. Write in detail about Event Handling with Java.
13. (a) Write about different parameter passing methods.
    (b) Write about parameter passing methods in C++.
14. Discuss in detail about abstract Data Type.
15. (a) Write in detail about design issues, advantages of built in exception handling.
    (b) Write suitable examples using C++ or Java to explain exception handling.
16. (a) Write about Logic programming languages.
    (b) Write about deficiencies of Prolog.
17. (a) Write about short circuit evaluation.
    (b) Write about Semaphores.
    (c) List any four reasons for studying programming languages.

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Code NO. 2080/BL

FACULTY OF ENGINEERING

B.E. 2/4(I.T) II-Semester (Backlog) Examination, October 2020

Subject: Data Communications

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

PART –A

Note : Answer any Seven Questions **(7x3=21 Marks)**

1. What are the Major Components of Data Communication System?
2 Describe Attenuation.
3 Describe Frame Relay.
4 Define Line Coding.
5 Distinguish between Datagram and Virtual Circuit.
6 Define Single bit errors and burst errors.
7 Explain the concept of Parity check and CRC in error detection.
8 What functions of physical layer.
9 What is CSMA/CD?
10 Describe the relative merits and demerits of different LAN topologies.

PART-B

Note : Answer any Three Questions **(3 x 18 = 54 Marks)**

11 (a) Difference between Synchronous and Asynchronous Transmission.
(b) Compare and contrast all Multiplexing techniques

12 (a) What is the purpose of Modulo 2 Arithmetic than binary arithmetic in computing FCS?
(b) Discuss any twoline coding schemes in detail.

13 Write about Error detecting and Error correcting codes Explain with Examples.

14 a) Explain in detail about ATM Protocol Architecture.
b) Explain about HEC operation at receiver.

15 What is Ethernet? What are the different types of Ethernet? Describe the Characteristics for one of the Ethernet types.

16 a) Explain Bluetooth Architecture.
b) Briefly describe ATM cell format.

17 Explain the concepts of Packet switching and how routing is done in Packet Switching.

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