Roll No. .....

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B. Tech. 3rd Semester (EE) Examination – March, 2021

MEASUREMENT AND INSTRUMENTATION

Paper : PCC-EE-210-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting ***one*** question from each Section. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Define the following terms : $1.5 \times 10 = 15$

(a) Resolution

(b) Threshold

(c) Eddy current

(d) Creep

(e) Air friction damping

(f) Electromagnetic induction

(g) Thermocouple

(h) Recording instrument

(i) Transducer

(j) Braking system

SECTION – A

2. Explain three forces in electromechanical indicating instruments in detail with neat and clean diagram. 15

3. Write short note on : 15

(a) Measurement of liquid level with transducer

(b) CRO

SECTION – B

4. Write short note on : 15

(a) Electrodynamometer type instrument

(b) Q-meter

5. Write short note on : 15

(a) Electrostatic instrument

(b) Multimeter

SECTION – C

6. Explain construction, working, advantage and disadvantage of induction type wattmeter. 15

7. Write short note on : 15

(a) Frequency meter

(b) Moving iron type power factor meter

SECTION – D

8. Write short note on : 15

(a) Wheat stone bridge

(b) Hays bridge

9. Write short note on : 15

(a) Anderson bridge

(b) Weins bridge

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B. Tech. 3rd Semester (EE) Examination – March, 2021

ANALOG ELECTRONICS

Paper : PCC-EE-205-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. (a) Explain the term cut in voltage of a diode. 2.5

(b) Why silicon diode is more popular than the Ge diode ? 2.5

(c) Define the term transconductance. 2.5

(d) Define clipping circuits. 2.5

(e) Explain in brief the applications of EMOSFET. 2.5

(f) What do you mean by difference amplifier ? 2.5

UNIT – I

2. (a) Explain in detail the VI characteristics of a diode. 8

(b) Explain the working of zener diode. 7

3. (a) Explain the working of BJT in common emitter configuration. 10

(b) Explain in brief BJT act as a switch. 5

UNIT – II

4. Explain in detail the construction and operation of n channel D MOSFET. 15

5. (a) Discuss how MOSFET act as an amplifier ? 8

(b) Explain the working of small signal model of MOSFET. 7

UNIT – III

6. Explain the effect of open loop gain and bandwidth on circuit performance of operational amplifier. 15

7. (a) Derive an expression of inverting and non inverting configuration of operational amplifier. 8

(b) Explain the role of feedback in the amplifiers. 7

UNIT – IV

8. Explain in detail the following :

(a) Precision amplifier . 8

(b) Lead and lag compensator using op-amp. 7

9. (a) Explain the analog to digital conversion using operational amplifier. 8

(b) How operational amplifier can be used as voltage regulator ? 7

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B. Tech. 3rd Semester (EE) Examination – March, 2021

ELECTRICAL MACHINE - I

Paper : PCC-EE-209-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is *compulsory*. All questions carry equal marks.

1. (a) How energy can be stored or retrieved from a Magnetic system ?

(b) What causes over heating of Commutator in D.C. motor ?

(c) Define Pole pitch and Commutator pitch.

(d) Derive E.M.F. equation of D.C. generator.

(e) What is Hysteresis loss in transformer ? How it can be reduced ?

(f) State Biot-Savart's law. $2.5 \times 6 = 15$

SECTION – A

2. Derive expression for field energy, co-energy and field energy density and co-energy density for electromechanical energy conversion process in magnetic system. Assume linearity in the circuit. 15

3. State and explain Ampere's Circuital Law. Using the same law find out the magnetic field intensity H for an infinite line current, an infinite sheet of current. 15

SECTION – B

4. Describe armature winding of dc machine in detail with the help of suitable diagrams. 15

5. What do you mean by armature reaction in D.C. Machine ? Explain the effect of armature reaction in detail. How the effect of the same can be neutralized ? 15

SECTION – C

6. (a) A shunt generator delivers 195A at terminal p.d. of 250 V. The armature resistance and shunt field resistance are 0.02 Ohm and 50 Ohm respectively. The iron and frictional losses equal to 950 W. Find (a) e.m.f. generated (b) copper losses (c) output of prime mover (d) commercial, electrical and mechanical efficiencies 10

(b) Draw and explain open circuit characteristics for separately-excited D. C. Generator. 5

7. (a) Draw and explain characteristic curves of dc series motor. 10

(b) Compare Generator and Motor action. 5

SECTION – D

8. What are the necessary conditions for parallel operation of three phase transformer ? Explain parallel operation for equal voltage ratios of transformer. 15

9. (a) Explain the working and construction of auto transformer in detail. 10

(b) Explain magnetizing inrush current in power transformer. 5

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B. Tech. 3rd Semester (EE) Examination – March, 2021

ELECTRIC CIRCUIT ANALYSIS

Paper : PCC-EE-201-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in all, selecting ***one*** question from each Unit. Question No. **1** is ***compulsory***. All question carry equal marks.

1. Answer the following questions in brief : $6 \times 2.5 = 15$

(a) What is final condition in network elements ?

(b) What do you mean by steady and transient state response ?

(c) What is admittance ?

(d) What do you mean by mutual coupled circuit ?

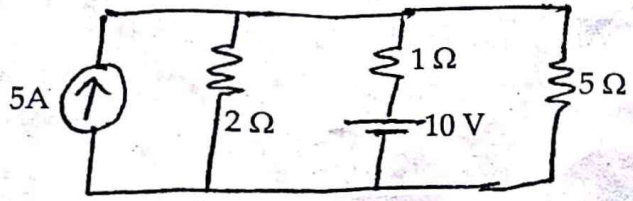
(e) What is transfer function ?

(f) What is Mesh analysis ?

UNIT – I

2. (a) State and prove the Venin's Th^m. 5

(b) Determine current through 5 Ω resistance of network shown in fig. by Thevenin's Th^m : 10



3. (a) State and prove maximum power transfer theorem. 10

(b) Define and explain the concept of duality and dual networks. 5

UNIT – II

4. Derive solution of second order differential equations for series R-L-C circuit. 15

5. (a) Find current in a series R-L circuit having R = 2Ω and L = 10 H while a DC voltage of 100 V is applied. What is the value of this current after 5 sec. of switching ON ? 10

(b) Give brief idea of forced and free response. 5

UNIT – III

6. (a) Test whether the function is Hurtwitz or not 10

$$S^4 + 3S^2 + 2$$

(b) Check whether the function is p.r.f. or not

$$F(s) = \frac{s^2 + s + 6}{s^2 + s + 1}$$ 5

7. Check whether the function is p.r.f. or not

$$\frac{(s+1)(s+2)}{s(s+4)(s+25)}$$ 15

UNIT – IV

8. (a) Explain cut set and tie-set in graph theory. 10

(b) Explain condition of reciprocity in Z, Y, T and H parameter. 5

9. Derive the equation for Z-parameter and also explain Z-parameter in terms of other parameters. 15

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B. Tech. 3rd Semester (EE) Examination – March, 2021

ENGG. MECHANICS

Paper : ESC-EE-202-G

Time : Three Hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting ***one*** question from each Section. Question No. **1** is ***compulsory***. All questions carry equal marks.

1. (a) Define truss, frame and centroid. 3

(b) Explain principle of moment. 3

(c) What is Equilibrium ? Explain conditions of Equilibrium and its types. 3

(d) Define parallel axis theorem. 3

(e) What is effect of Gyroscopic Couple on a Naval Ship during rolling ? 3

SECTION – A

2. What is tensors and its types ? Explain vectors and coordinate system. 15

3. Explain Euler's theorem for three dimensional rotation. 15

SECTION – B

4. A triangular plate in the form of an isosceles triangle ABC has the base BC = 10 cm and altitude = 12 cm. From this plate, a portion in the shape of an isosceles triangle OBC is removed. If O is the midpoint of the altitude of triangle ABC, then determine the distance of CG of the reminder section from the base. 15

5. (a) State and prove the theorem of parallel axis and perpendicular axis. 7.5

(b) Derive an expression for the moment of inertia of a quadrant of a circular plate of radius R. 7.5

SECTION – C

6. The turbine rotor of aship has a mass of 3500 kg. It has a radius of gyration of 0.45 m and a speed of 3000 r.p.m. clockwise when looking from stern. Determine the gyroscopic couple and its effect upon the ship :

(a) When the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h. 7.5

(b) When the ship is pitching in a simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 40 seconds and the total angular displacement between the two extreme positions of pitching is 12 degrees. 7.5

7. What is free body diagram ? Explain with four examples with elaborate different kinematic joints. 15

SECTION – D

8. What is Friction ? A solid shaft is to transmit 300 K W at 100 rpm if the shear stress is not to exceed 80 MPa, find the diameter of the shaft. What percentage saving in weight would be obtained if this shaft were replaced by a hollow one whose internal diameter equals 0.6 of the external diameter, the length, material & maximum shear stress being the same ? 15

B.Tech (2nd year) Environmental studies M.M.: 75

Note: Attempt any five questions.

Q1. What do you mean by non-renewable resources? Write a note on coal reserves of India.

Q2. Write a note on different modes of In-situ conservation strategies of biodiversity.

Q3. Write a note on chemical pollution and its effects on human health.

Q4. What is acid rain and discuss its harmful effects.

Q5. What do you mean by climate change and write a note on the role of green house effect in climate change.

Q6. Explain the importance of environmental education in present day context.

Q7. Explain the benefits and harms of nuclear power reactors.

Q8. What is the importance of protecting the glaciers on earth?

Q9. Discuss the scope of wind energy and its geographical distribution in India.

Q10. Discuss in detail the flow of energy in an ecosystem.