Code No: 11432/CBCS

FACULTY OF ENGINEERING

B.E IV – Semester (CBCS)(Civil/ECE/A.E.) (Main & Backlog) Examination, May/ June 2019

Subject: Environmental Sciences

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

Note: Answer all questions from Part-A & Any Five questions from Part-B.

PART – A (20 Marks)

1. Enumerate the causes and effects of over utilization of surface water sources.
2. Write about function of producers, consumers and decomposers in an ecosystem.
3. Explain about any two values of biodiversity.
4. Enlist various types of solid wastes.
5. State the importance of watershed management with respect to today's scenario.
6. Enlist the measures to reduce soil erosion.
7. State the advantages and disadvantages of various energy sources.
8. Discuss the salient features of enforcement act.
9. What are the components involved in Disaster management cycle?
10. Enumerate the cause and effects of land degradation.

PART – B (50 Marks)

11. a) Discuss the various advantages and disadvantages of dams.
    b) Give the detailed classification of Renewable and non-renewable resources.

12. a) Discuss in detail about Energy Flow in an Ecosystem.
    b) Explain in detail the structure and functions of Oceans.

13. a) State and explain about endangered and endemic species of India.
    b) Give the detailed classification of Biodiversity.

14. a) State the causes, effects and control measures of water pollution.
    b) Discuss the salient features of Water and Air act.

15. a) Explain in detail about various approaches for conservation of water management.
    b) Give the detailed classification of disaster.

16. a)Define food chain and Ecological Pyramids with suitable examples.
    b) What is meant by greenhouse gas effect? Explain how it is harmful?

17. a) Discuss various methods of solid waste management.
    b) Write short notes on Ozone layer depletion.

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Code No: 11436/CBCS

FACULTY OF ENGINEERING

BE (CBCS) (EEE) IV-Semester (Main & Backlog) Examination, May / June 2019

Subject: Electrical Machines - I

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

Note: Answer ALL questions from Part-A and any FIVE questions from Part-B

Part-A(20 Marks)

1. State the various phenomena useful for the electromechanical energy conversion in rotating machines 2
2. Define field energy and co-energy. 2
3. What are the functions of interpoles and how are the interpole windings connected 2
4. A 6-pole 10k W, 240 V d.c. machine is wave connected. If this machine is now lap connected, all other things remaining the same, calculate its voltage, current and power ratings 2
5. Give the conditions to build up voltage in shunt generator 2
6. Define critical resistance of a DC shunt generator 2
7. List the Protective devices in a starter 2
8. A d.c. motor develops a torque of 200 N-m at 25 rps. At 20 rps what is the developed torque 2
9. Define the following terms: Bases speed, speed regulation, speed range 2
10. In a brake test the efficiency load on the branch pulley was 40kg, the effective diameter of the pulley 73.5 cm and speed 15 rps. The motor takes 60A at 230V Calculate the output power. 2

Part-B (50 Marks)

1. a) Show that the reaction of coupling magnetic field on the electrical or mechanical system is essential for the electromechanical energy-conversion process. 5

   b) Describe the principle of virtual work and hence show that the magnetic force fe is given by the expression $f_e = -\frac{\partial W_{fld}}{\partial x}(\cdot\cdot, x) = -\frac{\partial W_{fld}}{\partial x}(¤, x)$ 5

12 Design and draw a simplex wave winding with the following data : 6 poles, 15 slots, 2 coil sides per slot, progressive winding. 10

Indicate the location of brushes on the winding diagram.

13 a) How are the series and shunt windings arranged on the pole of d.c. compound machine? How will you distinguish between series and shunt windings of a d.c. compound machine? 5

b) A 4 pole dc compound generator armature, series, and shunt field resistances of 1Ω, 0.5Ω and 100Ω respectively. This generator delivers 4k W at a terminal voltage of 200 V. Allowing 1 V per brush for contact drop, calculate for both short and long shunt connections a) the generated e.m.f and b) the flux per pole if the armature has 200 lap connected conductors and driven at 750 rpm. 5

14 a) Derive the speed-current characteristics of D.C. series motors. Sketch these characteristics in one figure on the assumption of i) same speed at no load and ii) rated speed at rated current. Comment on the nature of these characteristics. 5

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b) A 200 V D.C. shunt motor takes 22A at rated voltage and runs at 1000 r.p.m its field resistance is 100Ω and armature circuit resistance (including brushes) is 0.1Ω . Compute the value of additional resistance required in the armature circuit to reduce the speed to 800 r.p.m when

a) the load torque is independent of speed (as in a reciprocating pump)

b) the load torque is proportional to speed. 5+5

15 a) Enumerate the various losses in a D.C. machine. Which of these losses are constant? Derive expressions for the efficiency of a D.C. generator and a D.C. motor 5

b) A 500 V shunt motor takes a total current of 2 amps on no load. The resistance of the armature including brushes is 0.2 ohm and the field resistance is 250 ohm. On full load the total current taken from the mains is 52 amps. Calculate the full motor output and its efficiency. 5

16 a) What is the effect of excitation, speed and load on the losses of a D.C. machine? 5

b) A 220V d.c. shunt motor takes 27A rated voltage and runs at 800 r.p.m. Its field resistance is 100Ω If an additional resistance of 20Ω is inserted in the armature circuit, compute the motor speed and the line current in case load torque varies as the square of the speed. 5

17 Explain any two from the following 5+5

a) Applications of d.c. generators

b) Explain what happens when the field current of a shunt wound motor is reduced suddenly by about 5%

c) Parallel operation of d.c. generators.

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Code No. 11442/CBCS

FACULTY OF ENGINEERING

B.E IV-Semester (CBCS) (Inst) (Main & Backlog) Examination, May / June 2019

Subject : Signal and Systems

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

Note : Answer all questions from Part-A & Any five questions from Part-B

Part - A (20 MARKS)

1. Find whether the system is time invariant or time variant $y(n) = x^2(n) + \frac{1}{x^2(n-1)}$ 2
2. Find out the signal is Periodic or Aperiodic $x(t) = e^{-5t}.u(t)$. 2
3. Write Trigonometric Fourier series Equations. 2
4. Write the condition for orthogonality of two functions. 2
5. Prove the Linearity property of Fourier Transform. 2
6. Find the Fourier Transform of $x(t) = e^{-4t}.u(t)$. 2
7. Find the Laplace Transform of signal $x(t) = e^{j\mu t}.u(t)$. 2
8. Explain the relation between Laplace Transform and Fourier Transform. 2
9. Find Z-transform of signal $x(n) = 2.\left(\frac{1}{5}\right)^n .u(n)$. 2
10. Define ROC for Z-transform. 2

Part - B (50 MARKS)

11. a) Determine whether the following signal is a power or energy signal 4

$$x(t) = e^{j\left[3t + \frac{\text{®}}{2}\right]}$$

b) Test the following system for linearity, time invariance, and stability 6

$$y(n) = a^{x(n)}$$

12. Explain the symmetry properties of Trigonometric Fourier series. 10

13. a) Determine Fourier Transform of the signal $x(t) = e^{-a|t|}.\text{sgn}(t)$ 5

b) Find Fourier transform of a Gate Function. 5

14. a) By first determining $x(t)$, verify the final value theorem for the following function 5

$$X(s) = \frac{s}{(s+1)(s+2)}$$

b) Find the inverse Laplace transform of the following function. 5

$$G(s) = \frac{s}{(s+3)(s^2+4s+5)}$$

15. a) Find Inverse Z-Transform of 5

$$X(z) = \frac{(1/6)z^{-1}}{\left(1-(1/2)z^{-1}\right).\left(1-(1/3)z^{-1}\right)}; ROC\,|z| > \frac{1}{2}$$

b) Determine the impulse response of the following system using z-transform method. $y(n)-3y(n-1)-4y(n-2)=x(n)+2x(n-1)$ 5

16 a) Write short note on Discrete system and continuous system with examples 6

b) Find stability and causality of the following system 4

$$y(n)=\sum_{k=-\infty}^{n+5} x(k)$$

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17. Write short notes on 10

a) Sampling Theorem

b) Orthogonal Signal Space

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Code No. 11452/CBCS

FACULTY OF ENGINEERING

B.E. (M/P) IV-Semester (CBCS) (Main & Backlog) Examination, May / June 2019

Subject: Design of Machine Elements

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

Note: Answer all questions from Part-A and answer any five questions from Part-B.

PART – A (20 Marks)

1 Discus about general Considerations in Machine Design

2 What is meant by “Stress Concentration”?

3 State the classification of shafts.

4 How are the Saddle keys classified?

5 Discuss the assumptions of Boiler Joints in designing.

6 Define the term ‘Factor of safety’

7 Differentiate between differential screw and compound screw.

8 A bolt is designated as M24 x 2. What these two numbers signify?

9 What is the purpose of the gasket joints?

10 Briefly explain about Maximum shear stress theory.

PART – B (50 Marks)

11 A shaft made of mild steel is required to transmit 100kW at 300r.p.m. The supported length of the shaft is 3 metres. It carries two pulleys each weighing 1500N supported at a distance of 1 metre from the ends respectively. Assuming the safe value of stress, determine the diameter of the shaft.

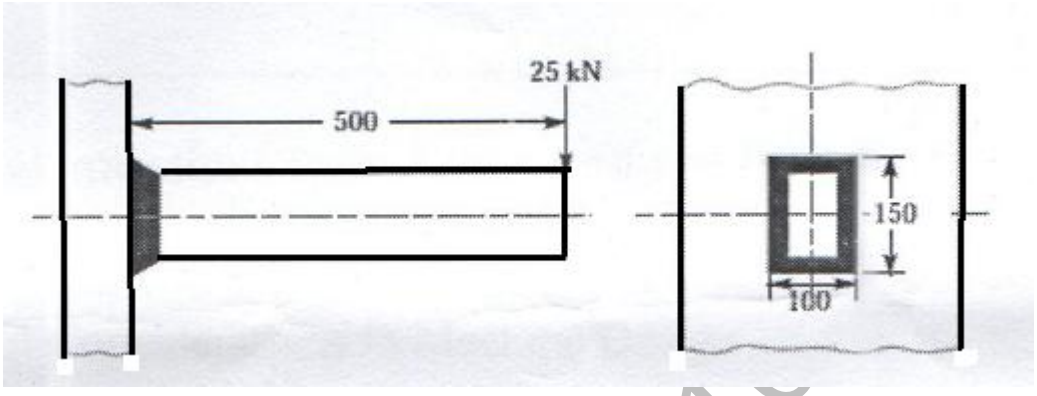
12 A simply supported beam has a concentrated load at the centre which fluctuates from a value of P to 4 P. The span of the beam is 500mm and its cross-section is circular with a diameter of 60mm. Taking for the beam material an ultimate stress of 700MPa, a yield stress of 500MPa, endurance limit of 330MPa for reversed bending, and a factor of safety of 1.3, calculate the maximum value of P. Take a size factor of 0.85 and a surface finish factor of 0.9.

13 Design a knuckle joint to transmit 150kN. The design stresses may be taken as 75MPa in tension, 60MPa in shear and 150MPa in compression.

14 Design a lap joint for a mild steel flat tie-bar 200 mm × 10 mm thick, using 24mm diameter rivets. Assume allowable stresses in tension and compression of the plate material as 112MPa and 200MPa respectively and shear stress of the rivets as 84MPa. Show the disposition of the rivets for maximum joint efficiency and determine the joint efficiency. Take diameter of rivet hole as 25.5mm for a 24mm diameter rivet.

..2

15 A rectangular cross-section bar is welded to a support by means of fillet welds as shown in figure. Determine the size of the welds, if the permissible shear stress in the weld is limited to 75MPa.



All dimensions in mm

16 A rod consists of an axial pull of 12kN together with a transverse shear force of 5kN. Find the diameter of rod required according to
   a) Maximum principal stress theory
   b) Maximum shear stress theory
   c) Maximum principal strain theory
   d) Maximum strain energy theory and
   e) Maximum distortion energy theory.

17 Wrote a short notes on
   a) Good man's diagram
   b) Bolts of uniform strength
   c) Differential screws
   d) Marine type of coupling

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Code No: 11462/CBCS

FACULTY OF ENGINEERING

B.E. IV Semester (CBCS)(CSE)(Main & Backlog) Examination, May/June 2019

Subject: Microprocessors & interfacing

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

Note: Answer all questions from part-A, & Any five questions from Part-B

PART – A (20 marks)

1.	Write an assembly language program to find sum of two eight bit numbers?	2
2.	Draw the flag register of 8085 microprocessor?	2
3.	Write examples of use of stacks and subroutines instructions?	2
4.	What are the registers used in 8259A?	2
5.	What are the advantages of using segment registers in 8086?	2
6.	Define BSR mode in 8255A (PPI)?	2
7.	Write short note on RS-232?	2
8.	What is linking?	2
9.	List out the addressing modes of 8086?	2
10.	Differentiate between 8085 and 8086 microprocessor?	2

PART – B (50 Marks)

11.	a)Explain Arithmetic and Logical instructions of 8085 microprocessor with an example ? b) Draw and explain the flag register of 8085 microprocessor?	5 5
12.	Describe the 8257 DMA controller with neat diagram?	10
13.	Explain 8254 Programmable Interval Timer with various modes?	10
14.	Explain the addressing modes of 8086 microprocessor with an example?	10
15.	Draw and explain the 8086 microprocessor architecture?	10
16.	a) Explain the register structure of 8086 microprocessor? b) Explain 8086 assembler directives with an example?	5 5
17.	Explain a) Analog to Digital converters b) Hardware and software interrupts	 5 5

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