



AENC Mains) 2013



FOR EVALUATOR'S USE ONLY

Sub. Code : **58**

Optional Paper

Electrical Engineering : Paper-II

Time : 3 Hours / Maximum Marks : 200 / Total Pages : 32

Evaluation Table												(For Evaluator's Use Only)		
PART-A				PART-B				PART-C				Grand Total		
QN	E-1	E-2	AC	QN	E-1	E-2	AC	QN	E-1	E-2	AC	PART-A		
1				21				33				PART-B		
2				22				34				PART-C		
3				23				35				Total		
4				24				36				(-) Marks		
5				25				37				Final Total		
6				26				38				Marks in Words		
7				27				39				Remarks of Evaluator/Chief Evaluator		
8			28											
9				29										
10				30										
11				31								Remarks of Scrutiniser		
12				32										
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20														
Total														
Evalu ator's Sign														



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PART - A

Marks : 40

Note : Attempt all the twenty questions. Each question carries 2 marks. Answer should not exceed 15 words.

1 Classify the errors in measurements.

2 What is feedback transducer ?

3 Define Schotky Diode.



4 Differentiate DTL and TTL.

5 Define Flip-Flop as a memory element.

6 Discuss briefly the operation of a voltage source inverter.

7 What are the differences between BJTs and IGBTs ?

8 Define Calibration.

9 When two amplifiers each of bandwidth $f_H = 10$ kHz are cascaded what will be the bandwidth of the overall system ?

10 Why thyristors are not preferred for inverters ?

11 What is meant by PWM control ?

12 How many memory locations can be addressed by a microprocessor with 14 address lines ?

13 Why Negative Feedback is preferred in the control system ?

14 For the open-loop transfer function $G(s) = \frac{s-1}{s^2+1}$, state with justification whether the system is stable, unstable or marginally stable.

15 Suggest suitable transducer for converting thermal energy to equivalent voltage.



16 In a single-phase fully controlled bridge converter, if one thyristor gets open, then what will be the behavior of the converter ?

17 In a three-phase semi-converter, if firing angle is less than or equal to 60° , then what would be the duration of conduction of each thyristor and diode ?

18 Write the good characteristics of MOSFET, which suggest its use in power electronic circuits.

19 The open loop transfer function of a unity feedback system

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

what is the phase margin of the system ?

20 The disk memory is random access, semi random access or sequential access memory.

PART - B

Marks : 60

Note : Attempt all the twelve questions. Each question carries 5 marks. Answer should not exceed 50 words.

21 Discuss the forced commutation techniques of thyristors, in brief.

22 Compare the functions of the three electrodes in an FET with a junction transistor.

- 23 A Common-Emitter Amplifier with an R_L of 2 k Ω has the following d.c. voltages :

$V_{CC} = 9\text{ V}$, $V_C = 5\text{ V}$. Calculate (a) Voltage across R_L and (b) Value of I_C .

- 24 Define Nyquist criterion for determining the closed-loop stability of a linear control system.



- 25 Construct a logic circuit to give an output $X = (\overline{AB} + \overline{AB})(\overline{AD+C})$ without any reduction in number of gates.

- 26 A system has the following transfer function :

$$\frac{C(s)}{R(s)} = \frac{s^2 + 3s + 4}{s^2 + 4s + 4}$$

Find $c(t)$ when $r(t)$ is a unit step signal.

27 Explain working principle and uses of LVDT.

28 How the data is stored in DRAM and SRAM ?

29 Draw poles and zeros for $Y(s) = \frac{s^2 + 4s + 3}{s^2 + 6s + 8}$ and evaluate $Y(t)$.

30 What are the different buses in the internal architecture of microprocessor?
What is tristating of a bus? What is its utility?

31 Explain briefly the difference between I/O mapped I/O and Memory mapped I/O.

32 What care must be taken in measuring low resistances ?

PART - C

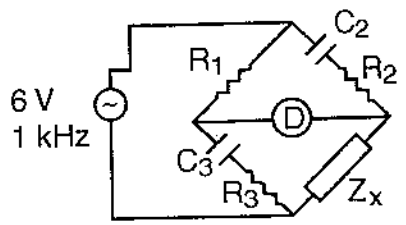
Marks : 100

Note : Attempt any 5 questions. Each question carries 20 marks. Answer should not exceed 200 words.

- 33 Discuss the principle of working of a three phase bridge inverter with an appropriate circuit diagram. Draw output voltage waveforms on the assumption that the each thyristor conducts for 180° and the load is star connected. The sequence of firing of each thyristor should also be indicated in the diagram.

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- 35 The following data relate to the bridge shown below :
 $R_1 = 200 \Omega$, $R_2 = 200 \Omega$, $C_2 = 5 \mu\text{F}$, $R_3 = 500 \Omega$ and $C_3 = 0.2 \mu\text{F}$.



Find the constants of Z_x considering it as a series circuit.

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- 38 Sketch the circuit of the Wien bridge oscillator using an operational amplifier as the active element and write the expression for frequency of oscillation.

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- 39 Sketch the combinational circuit for full adder and explain its working. Also explain adder overflow.

SPACE FOR ROUGH WORK



SPACE FOR ROUGH WORK



SPACE FOR ROUGH WORK

