

# MODEL EXAMINATION FEBRUARY 2012

## ELECTRONICS SERVICE TECHNOLOGY - 1

Maximum Score : 60

Time : 2 Hours

STD:XI

Cool off time : 15Minutes

### General Instructions to Candidates:

- There is a 'Cool off time' of 15 minutes in addition to the writing time of 2 Hrs.
- You are not allowed to write the answers nor to discuss anything with others during 'Cool off time'
- Use 'cool off time' to get familiar with questions and to plan your answers.
- Read questions carefully before answering.
- All questions are compulsory and only internal choice is allowed.
- When you select a question, all the sub-questions must be answered from the same question itself.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Give equations wherever necessary.

1. Select the highest resistance value from the following:

- a) Yellow, Violet, Black, Gold.
- b) Brown, Green, Black, Gold.
- c) Brown, Black, Black, Gold.
- d) Blue, Grey, Black, Gold. (1)

2. Classify the following components into active and passive

- a) 2N2646 (b) OA 79 (c) BFW10 (d) 102 (2)

3. (a) For a sinusoidal AC voltage of rms value 70.7V the peak to peak value is

----- (1)

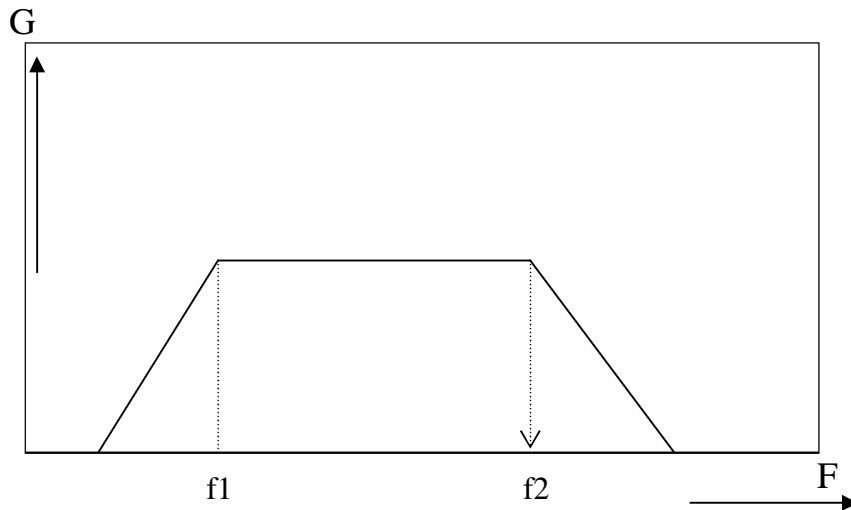
- b)  $V_1=4\sin 628t$   $V_2=8\sin(628t+90^\circ)$ . Sketch the waveforms  $V_1$  and  $V_2$  on the same graph indicating peak voltages and time periods. Find the frequency and rms value of the signals. (3)

4. The equivalent resistance of four resistors joined in parallel is  $20\ \Omega$ . The current flowing through them are  $0.6\text{A}$ ,  $0.4\text{A}$ ,  $0.2\text{A}$  and  $0.1\text{A}$ . Calculate the value of each resistor. (3)
5. Compare the reverse characteristics of IN 4001 and  $6.2\text{V}$  zener diode. (3)
6. Ripple factor of a bridge rectifier is \_\_\_\_\_ (1)
7. Match the following

| Device          | Feature           |     |
|-----------------|-------------------|-----|
| (a) DIAC        | $I_E = I_C + I_B$ |     |
| (b) FET         | Dark current      |     |
| (c) Transistor  | PIV               |     |
| (d) Diode       | Holding current   |     |
| (e) Photo diode | Bidirectional     |     |
| (f) SCR         | Pinch of voltage  | (3) |

8. (a) Draw the symbols of NPN and PNP transistors (1)
- (b) Name three layers of PNP transistor. Compare the three layers. (3)
9. (a) Name the two basic types of MOSFET (1)
- (b) Draw the characteristics of FET. (3)
10. You have to match high source impedance to low load impedance. Which transistor configuration you will select? (1)
11. Write any two different methods to change the conductivity of a semiconductor (2)

12. The following figure shows the frequency response of an amplifier.



- (a) Identify the amplifier (1)  
 (b) The figure shows that there will be a fall in gain at both ends. Explain this with reason (3)
13. (a) Name any two transistor biasing methods (1)  
 (b) Explain with diagram the most commonly used biasing method (3)
14. A circuit generate an output frequency of  $f = \frac{1}{2\pi \sqrt{6} RC}$
- (a) Name the circuit (1)  
 (b) Sketch the circuit diagram (3)
15. Compare the output waveform of a bridge rectifier with capacitor and inductor filter. (2)
16. Suggest an amplifier which corresponds to a half wave rectifier (1)
17. (a) Write a suitable feedback circuit for an amplifier circuit (1)  
 (b) Give reasons for your selection (3)
18. (a) \_\_\_\_\_ instrument is used to visualize the wave forms (1)  
 (b) Draw its block diagram (3)

OR

19. Name and draw the block diagram of an instrument which can generate square, sine and triangular waves. (4)
20. (a) A PMMC instrument may be converted to a DC volt meter by connecting appropriate values of resistors in \_\_\_\_\_ with the coil. (1)  
 (b) Convert a D'Arsonval PMMC meter into a volt meter having voltage range 0 - 100 volts. The current sensitivity of PMMC meter is  $100\mu A$  and its internal resistance is  $500\Omega$ . (3)
21. (a) Name any two types of modulations schemes. (1)  
 (b) Compare them with wave forms (4)

OR

22. (a) If the modulation frequency is  $f_m$ . The band width of AM is \_\_\_\_\_ and band width of FM is \_\_\_\_\_ (1)  
 (b) Draw the block diagram of AM receiver. (4)

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