18PHP08

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2022
(Second Semester)

Branch – **PHYSICS**

ANALOG & DIGITAL ELECTRONICS AND MICROPROCESSORS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (5 x 1 = 5)

1. A JFET is a _____ device.
   (a) Current driven device (b) Voltage driven device
   (c) rectifier device (d) capacitance device

2. Multiplex means _____.
   (a) many to one (b) one to many
   (c) one to one (d) one to two

3. A ring counter resembles a _____ register.
   (a) left or right (b) shift left
   (c) shift right (d) straight

4. When in a negative scalar, both R1 and Rf are reduced to zero, the circuit functions as _____.
   (a) integrator (b) subtractor
   (c) comparator (d) unity follower

5. Microcontrollers are used for _____ applications.
   (a) un control (b) receive
   (c) control (d) none of the above

SECTION - B (15 Marks)
Answer **ALL** Questions
ALL Questions Carry **EQUAL** Marks (5 x 3 = 15)

6 a Describe the construction and working of a FET.

OR

b Explain the working of p-n junction diode under forward and reverse biasing.

7 a Convert $Y = AB + AC + BC$ into standard SOP form.

OR

b What is demultiplexer? Explain the working of a 1 : 4 demultiplexer.

8 a Explain the operation of the clocked RS flip flop with a diagram and truth table.

OR

b Explain the operation of shift register with block diagram and waveform diagram.

9 a Analyze the characteristics of an ideal OPAMP.

OR

b With a neat circuit diagram, discuss the working of a monostable multivibrator.

Cont...

10 a Write any five instructions in data transfer group. Explain their function with examples.

OR

b Explain Memory mapped I/O scheme and I/O mapped I/O scheme.

SECTION -C (30 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** Marks (5 x 6 = 30)

11 a Analyze an experiment to determine the characteristics of a transistor in a common emitter mode.

OR

b Describe the construction and working of MOSFET with a neat circuit diagram.

12 a Discuss the method of three variable Karnaugh map simplification with necessary diagram.

OR

b What is decoder? Explain the function of BCD to 7 segment decoder with a neat diagram.

13 a Explain the operation of the master slave flip flop with a neat diagram and give its timing diagram.

OR

b Outline the operation of D flip flop with a diagram and truth table.

14 a Describe the construction and working of Schmitt trigger using OPAMP.

OR

b With the circuit diagram, explain the working of OPAMP as triangular waveform generator. Give the expression for its frequency.

15 a Discuss the addressing modes of 8085 microprocessor with examples.

OR

b Draw the block diagram of the architecture of 8085 microprocessor and explain the function of each block

Z-Z-Z END