

Time: 3Hrs

Marks:-100

- N.B :** (1) All questions are compulsory.
 (2) Figures to the right indicate maximum marks.
 (3) Use of non-programmable calculators is permitted.
 (4) Symbols used have their usual meaning

Q1. A) Select correct answer (12)

- 1 The positive gravitational anomaly indicates-----
 (a) an excess of mass (b) a deficiency of mass
 (c) a reversal of the gravitational field (d) none
- 2 A Seismometer is an instrument used to detect and record-----
 (a) Earth quake (b) Rainfall
 (c) Atmospheric pressure (d) Weather condition
- 3 Which of the following is a data transfer instruction
 MOV A, C b) ANA B c) ADD D d) INR E
- 4 Which instruction below will always clear the accumulator
 ORI,00h b) ANI,00h c) SUI,00h d) ADI ,00h
- 5 Which of the following is not a natural source of radiation?
 a) Sea water b) Cosmic rays
 c) Earth d) Fluorescent lamp
- 6 Frequency modulation is -----
 a) Modulation of analog carrier by an analog signal
 b) Modulation of analog carrier by a digital signal
 c) Modulation of digital carrier by an analog signal
 d) Modulation of digital carrier by a digital signal

B) Answer in one sentence (03)

- 1 What do you mean by Radioactive pollution?
- 2 Identify the op-code and operand in the instruction STA , 3400h
- 3 Define Radiation Exposure.

C) Fill in the Blanks (5)

- 1 ----- water is the water that seeps through rocks and soil and is stored below the ground.
- 2 ----- island is an example of hot-spot generated volcanic peak that originated about 70 million years ago.
- 3 Number of bytes in the instruction MOV A, B is
- 4 RAR belongs to functional category of instructions.
- 5 The of digital signal is the number of bits sent out by its transmitter in one second.

- Q2. A) Attempt any one (8)
- 1 What is Seismology? What are seismic waves? What are the different types of seismic waves.
 - 2 Define 'Environmental Management'. Explain the importance of Environmental Management.
- B) Attempt any one (8)
- 1 Discuss the internal structure of earth.
 - 2 State the methods used for determination of the age of earth. Explain any one of them in detail.
- C) Attempt any one (4)
- 1 What is the difference between Geophysics and Geology?
 - 2 What is Geodynamo? Explain
- Q3. A) Attempt any one (8)
- 1 Explain in brief different registers in 8085 microprocessor.
 - 2 Write short notes on ALU, data bus and address bus.
- B) Attempt any one (8)
- 1 Six data bytes are stored in memory locations starting from 2400h. Write an assembly language program to add these bytes and store the sum and carry in the next consecutive locations.
 - 2 Write the content of the registers involved at the end of each instruction
 - i) MVI C , 56h
 - ii) MOV A,C
 - iii) RRC
 - iv) ADI , 78h
 - v) LXI H , 3200h
 - vi) MOV M,A
 - vii) INX H
- C) Attempt any one (4)
- 1 Write instructions to
 - a) AND the content of B with A
 - b) Complement A
 - c) Subtract data 73h directly from A
 - d) Load DE register pair with address 2400h
 - 2 Write the difference between following instructions with examples
 - a) CMP B and SUB B
 - b) DCR D and DCX D

- Q4. A) Attempt any one (8)
- 1 What is Radiotherapy? Explain the different ways of Radiotherapy.
 - 2 Explain the signal transmission process through broadband communication with examples. What are the advantages of broadband communication?
- B) Attempt any one (8)
- 1 Explain the properties of α , β and γ radiations.
 - 2 What is digital communication? What are the advantages of digital signals over analog signals?
- C) Attempt any one (4)
- 1 A person's stomach and colon are exposed to radiations separately of equivalent value of 90 mSv and 80 mSv respectively. Weighing factor for colon is 0.18 and for stomach 0.12. Calculate the effective dose and comment.
 - 2 What is the maximum length of antenna required for FM transmission which is between 88MHz and 108MHz?
- Q5. Attempt any Four (20)
- 1 Draw a neat and labeled diagram of an absolute gravimeter
 - 2 Explain the difference between oceanic and continental crust.
 - 3 Give flag format of 8085 microprocessor.
 - 4 Explain with example any two addressing modes in 8085 microprocessor.
 - 5 Define various types of radiation detectors.
 - 6 Explain three stages of demodulation with the help of suitable diagram.