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   Oceanic trenches ----------------------------
            (a) Are typically 8-10 km deep
            (b) parallel the edges of continents and island arcs
            (c) are narrow deep troughs   (d) none of these

     2   Unit of Measuring gravity anomaly is--------
            (a) Gal   (b) Tesla   (c) mGal   (d) MGal

     3   The instruction for " Do not perform any operation " is :
            a) MVI A ,00h   b) HLT   c) NOP   d) SUB A

     4   The data in accumulator after the execution of the instruction ORI , FFh is
            a) 00h   b) FFh   c)0Fh
               d)depends on the initial data in accumulator

     5   Which of the following is not a natural source of radiation?
            a) Fluorescent lamp   b) Cosmic rays
            c) Earth   d) Sea water

     6   An old bridge across a river lets only one lane of traffic pass at a time on
          either side. The transmission of traffic is_____
            a) Simplex   b) Half-Duplex
            c) Full Duplex   d) all of the above

     B) Answer in one sentence   (03)
     1   Define Seismic waves.
     2   Name the register pairs in 8085 Microprocessor
     3   What is Thermo luminescence dosimeter?

     C) Fill in the Blanks   (5)
     1   The ratio of total magnetization induced to the intensity of magnetic field
         is called -------------

     2   Seismogram is an instrument used for recording ----------

     3   The functional category to which the instruction JNZ , 5600h belongs is
         ....

     4   Program counter is a .... bit register.

     5   The _____ of digital signal is the number of bits sent out by its
         transmitter in one second.

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Q2. A) Attempt any one (8)
  1 What is Geophysics? What are the different branches of Geophysics Explain any one of them in detail.

  2 What is Earth's magnetic field? Explain inclination and declination angle with the help of diagram.

  B) Attempt any one (8)
  1 What do you mean by "Environmental Geomagnetism "? Discuss analysis of Environmental Impacts on Magnetic Materials.

  2 What is Urbanization? Discuss impact of urbanization and disposal of Industrial Waste on Environment.

  C) Attempt any one (4)
  1 Write a short note on Gravimeters.
  2 How the age of the earth is determined?

Q3. A) Attempt any one (8)
  1 Give the general format of flag register and state the function of each flag in 8085 Microprocessor.

  2 With reference to 8085 microprocessor , explain the following
       a) ALU   b) Address bus   c) data bus

  B) Attempt any one (8)

  1 Write an assembly language program for 8085 Microprocessor to multiply two 8 bit hexa-decimal numbers and store the product at the suitable memory location.

  2 Write 8085 instructions to
       i)   Load register B with the data A3 h
       ii)   To add data in Accumulator to that in B
       iii) To load DE register pair with the address of memory location C040h
       iv)   To store the accumulator content in the location pointed by DE register pair
       v)   To go to the next memory location
       vi)   To complement the data in accumulator
       vii) To copy the data in accumulator in register C
       viii) To clear the accumulator

  C) Attempt any one (4)
  1 Write an assembly language program for 8085 microprocessor to subtract 45h from 97h. What is the content in the accumulator at the end of the program?

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019C45E844B25A946B382956224540CC

2   Write the contents of registers involved at the end of each instruction.
Memory location 3500h contains the data B6h. Carry register is reset.
LDA , 3500h
RAL
MOV C, A

Q4. A) Attempt any one   (8)
1   What is Natural radioactivity? Describe with suitable examples.
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 Photoelectric effect and Compton effect.
2   Explain the essential components of any communication system with the
help of block diagram.

C) Attempt any one   (4)
1   50 Gy of X-rays can kill 50% of a tumour cells. It takes 5 Gy of alpha
particles to produce the same effect. Calculate the radiation weighing
factor for alpha particles.

2   The amplitude of a wave $5 \cos 804t$ is modulated by a wave
$6 \cos 680t$. Find the equation of modulated wave. The AM propagation
factor is 1.

Q5. Attempt any Four   (20)
1   Draw a neat and labeled diagram of proton magnetometer.
2   What are Anthropogenic activities? Draw a neat diagram of Earth's four
major layers.
3   Give the op code , operand and number of bytes in each of the following
instructions
   i)   SUB M   ii) LXIH , 5600h   iii) ADI , 67h
               iv) CMA v) MOV A,B

4   Explain any two addressing modes with examples
5   Distinguish between Alpha & Beta radiation.
6   Explain the process of Pulse Amplitude modulation.
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