West Bengal State University

B.A./B.Sc./B.Com (Honours, Major, General) Examinations, 2015

PART – III

COMPUTER SCIENCE — HONOURS

Paper – V

[Full Marks : 100

Duration : 4 Hours]

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer Question No. **1** and any *five* from the rest taking at least *one* from each Group.

$10 \times 2 = 20$

1. Answer any *ten* questions :
   - a) What are the disadvantages of optical fibre ?
   - b) What do you mean by unguided media ?
   - c) What do you mean by distributed computing ?
   - d) What are the differences between LAN and WAN ?
   - e) What are the functions of browser ?
   - f) What is the difference between Bit rate and Baud rate ?
   - g) What is Jitter ?
   - h) Why is the page size always a power of 2 ?
   - i) What is the advantage of normalized floating point number ?
   - j) What is machine cycle ?
   - k) What is the function of ALE pin in 8085 microprocessor ?
   - l) What is cycle stealing ?
   - m) Distinguish between RISC and CISC ?
   - n) What is cache coherence ?

Group – A

2. a) Define the term 'instruction cycle'. What is the function of stack pointer in 8085 MPU ?
   b) Differentiate between the following instructions :
      i) CALL and RET
      ii) PUSH and POP.

[Turn over

c) How many times will the two JNZ instructions be executed in the following sequence ? What will be the contents of H and L when the program control reaches to HLT instruction ?

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LXIH, 0503H
LOOP : DCRL
JNZ LOOP
DCR H
JNZ LOOP
HLT.
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d) Write the different hardware interrupts in 8085 microprocessor with proper explanation. (2 + 2) + (2 + 2) + (2 + 2) + 4

3. a) Make a suitable comparison between 8085 and 8086 microprocessor ?
   b) Describe the timing diagram of OUT instruction with suitable diagram.
   c) Why is data bus bidirectional ?
   d) Mark the difference between RRC and RLC. 4 + 8 + 2 + 2

4. a) Write an assembly language program to perform G.C.D. for three numbers.
   b) Explain how daisy-chaining is used for bus arbitration in a multiprocessor system.
   c) A computer has main memory capacity of 16 M bytes and a cache memory of 32 K bytes. Each block of 51 bytes in main memory is mapped onto a similar size block in cache using direct mapping technique. Show the partitioning of the cache address register into tag field, sector field and block field. Explain how cache will be accessed. Discuss how hit ratio can be improved. 4 + 6 + 6

5. a) Justify the statement "stack computer consists of an operation code only with no address field".
   b) Discuss Flynn's classification of computer.
   c) Explain the different types of mapping procedures in the organisation of cache memory with diagram.
   d) A digital computer has a common bus system for 16 registers of 32 bits each. The bus is constructed with multiplexers.
      i) How many selection inputs are there in each multiplexer ?
      ii) How many multiplexers are there in the bus ?

   2 + 2 + 6 + (3 + 3)

Group – B

6. a) Explain FDM. State the application of FDM.
   b) Describe PSK. What is the bandwidth required for PSK transmission ?
   c) Encode the binary data stream 11000010 into waveform of (i) Unipolar return to zero (RZ), (ii) Polar return to zero (RZ), (iii) Polar non-return to zero (NRZ), (iv) AMI, (v) Manchester. 5 + 6 + 5

7. a) Explain Shannon's theorem. How does it differ from Nyquist theorem ?

b) If a binary signal is sent over a 3 kHz channel whose signal-to-noise ratio is 20 dB, what is the maximum achievable data rate ?

c) Write a short note on Fibre optic cable.

d) What is transmission impairment ? Discuss briefly different types of transmission impairment.

e) Encode the 7-bit stream 1010011 with ASK, FSK and PSK.

8. a) What is the difference between open-loop congestion control method and closed-loop congestion control methods ?

b) Why is RARP protocol used ? How does it map a MAC address to an IP address ? Describe with a suitable example.

c) What is the advantage of star topology over mesh topology ?

d) Generate Hamming code for the bit sequence 1101001. 4 + 4 + 4 + 4

9. a) What is the need of protocol ?

b) Briefly describe the functions of data link layer and transport layer in OSI model.

c) Explain different framing techniques in data link layer. 4 + (3 + 3) + 6

Group – C

10. a) What are the differences between Intranet and Internet ?

b) What is router ?

c) What is the functioning of MODEM ?

d) What do you mean by Internet Service Providers ?

e) Describe MAN. 4 + 3 + 3 + 4 + 2

11. Write short notes on any *four* of the following : 4 × 4

a) E-mail

b) Video conferencing

c) www

d) ISDN

e) DNS.