M.E. First Semester (Digital Electronics) (Part Time / Full Time) (C.G.S. - New)

13201 : Digital Instrumentation : 1 UMEF 1

P. Pages : 2 | **AU - 3315**

Time : Three Hours | Max. Marks : 80

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Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.
3. Use of Non programmable calculator is permitted.
4. Use of pen of Blue/Black ink/refill only for writing the answer books.

1. a) Explain the method of measurement of high frequency using a digital frequency measurement technique. **7**

b) Draw a suitable scheme for measurement of product of two frequencies and explain its operation. **7**

OR

2. a) Explain any one method of measuring Quality Factor of a capacitor. **7**

b) What is the resolution of a time measuring system, if the maximum value of the time interval to be measured is 10ns, oscillator frequencies are $75MH_Z \pm 0.5kH_Z$, threshold voltage of the comparator used is 2mV and the amplitude of both the oscillator outputs is 350mV? **7**

3. Describe construction and working of a Network analyser. Enlist its applications. **13**

OR

4. a) Explain harmonic distortion analyser using bridge T-network. **6**

b) Explain in brief how a signal can be analyzed with the help of wave analyzer. **7**

5. a) Explain how primary and secondary addresses for the IEEE-488 bus are selected. **7**

b) Enlist and elaborate various applications of a field bus. **6**

OR

6. a) What are the special requirements in design of virtual instruments to be employed in hazardous area? **6**

b) Explain the use of computer based Automatic Test Equipment for PCB testing. **7**

7. a) Explain the operation of a digital temperature sensor. **7**

b) What is virtual instrumentation? State the advantages of virtual instruments over conventional instruments. **7**

OR

8. a) Draw the block diagram of a typical Data Acquisition system. Explain the purpose of each component. **10**

   b) What do you understand by an intelligent sensor? **4**

9. a) Explain a typical scheme for distributed computer control using suitable block diagram. **7**

   b) What is World FIP system? Draw its block diagram and enlist various features. **6**

OR

10. a) Develop velocity form of a digital PID controller from the basic analog PID controller expression suggest modifications to obtain better accuracy and noise reduction. **9**

    b) What is integral wind-up? **4**

11. a) Ladder diagram of a PLC sequences is shown in Fig. 1 Write equivalent Boolean language code using LOAD, STORE, AND, OR and NOT operations. **6**

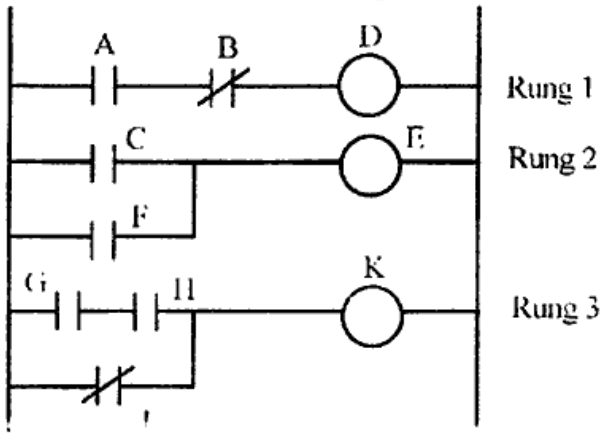

Fig.1

   b) Draw a typical PLC architecture. What are the modes of operation of PLC? **7**

OR

12. a) What is the use of an isolation preamplifier in the modern ECG machine? Draw its block diagram and explain its operation. **6**

    b) Draw the schematic diagram of an EEG machine and explain its working. **7**

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