Reg No.:_____   Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SIXTH SEMESTER B.TECH DEGREE COMPREHENSIVE EXAMINATION, MAY 2019

Course Code: MR352

Course name: COMPREHENSIVE EXAM (MR)

Max. Marks: 50   Duration: 1Hour

Instructions: *(1) Each question carries one mark. No negative marks for wrong answers*
                           (2) Total number of questions: 50
                           (3) All questions are to be answered. Each question will be followed by 4 possible answers of which only ONE is correct.
                           (4) If more than one option is chosen, it will not be considered for valuation.
                           (5) Calculators are not permitted

PART A- COMMON COURSES

1. The slope of the surface $z = xe^{-y} + 5y$ in the x-direction at the point (4,0) is

   a) 0   b) -1   c) 1   d) 2

2. The solution of $(D^2 + 1)y = 0$ is

   a) $c_1 \cos x + c_2 \sin x$ b) $c_1 e^x + c_2 e^{-x}$ c) $(c_1 + c_2 x)e^x$ d) $(c_1 + c_2 x)e^{-x}$

3. A simple spring mass vibrating system has a natural frequency of N. if the spring stiffness is halved and the mass is doubled then the natural frequency will be

   a) N   b) 0.5N   c) 2N   d) 0.25N

4. The proportion of second moment of area about centroidal axis to second moment of area about base of a rectangle will be

   a) 0.3   b) 0.1   c) 0.25   d) 0.08333

5. An algorithm for scheduling a set of project activities:

   a) Critical Path Method   b) Crucial Practicing Method   c) Centre Processing Method   d) None

6. The fundamental rethinking and radical redesign of the business process to achieve dramatic improvements in critical contemporary measures of performances such as cost,quality,service and speed:

   a) Recycling   b) Quality engineering   c) Contemporary design   d) Re - engineering

7. Composting is

   a) anaerobic degradation process for solid waste treatment   b) anaerobic treatment for sullage   c) aerobic treatment for sewage   d) an aerobic degradation process for solid waste treatment

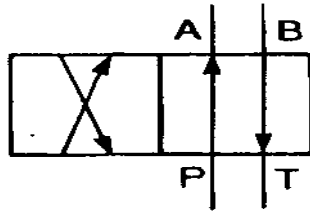8. The rating system of India which is focussed on conservation and efficient energy use is

    a)   GRIHA   b) LEED India   c) IGBC   d) BEE

9.   In orthographic projection, each projection view represents how many dimensions of an object?

    a)   1   b) 2   c) 3   d) 0

10.   The front view, side view and top view of a cylinder standing on horizontal plane base on horizontal plane.

a) circle, rectangle and rectangle	b) rectangle, rectangle and circle	c) rectangle, circle and rectangle	d) circle, triangle and triangle

PART B- CORE COURSES

11. **The systematic errors of an instrument can be reduced by making**

a) The sensitivity of instrument to environmental input as low as possible	b) The sensitivity of instrument to environmental input as high as possible	c) Systematic errors does not depend on the sensitivity of instrument	d) None of these

12. **Azero order system is the one in which output changes instantaneously as the input changes. The example of zero order system is**

a) Potentiometer	b) Liquid – in – glass thermometer	c) Accelerometer	d) Transducer

13. Mechanical transducers sense _____

a) electrical changes	b) physical changes	c) chemical changes	d) biological changes

14. **Which of the following statements is/are true?**

a) Pyrometer is a non-contact type of instrument	b) Stroboscope is a contact type of instrument	c) Micrometer is a non-contact type of instrument	d) All of the above

15. **Testing flatness or straightness of a surface is possible using**

a) vernier caliper	b) micrometer	c) autocollimator	d) all of the above

16. **Why are pitch errors observed in threads?**

a) Lack of inspection	b) Incorrect ratio of tool work velocity	c) Interference between mating parts	d) All of the above

17. Energy cot is highest in the case of ………….. system

a) Electric	b) hydraulic	c) Pneumatic	d) b&c

18. Which of the following term does not involve ideal gas law

a) Pressure   b) Volume   c) Temperature   d) Time

19.

is a symbol of

a) 4/3 valve   b) 3/2 valve   c) 4/2 valve   d) None of these

20. Which of the following is not a part of construction of atypical cylider

a) Rod seal   b) Wiper seal   c) Static seal   d) Weld and seal

21. IP converter works on the principle of

a) Volume booster   b) Flapper nozzle   c) Air relay   d) Force balance principle

22. Logic gate equivalent to staircase wiring is

a) OR gate   b) AND gate   c) XNOR gate   d) XOR gate

23. Tachometer is a

a) Velocity feedback device   b) Voltage feedback device   c) Current feedback device   d) Acceleration feedback device

24. The CGS unit of kinematic viscosity is _____

a) Poise   b) Stoke   c) Pascal   d) None of these

25. Pressure which is measured with the help of a pressure measuring instrument in which atmospheric pressure is taken as datum is known as _____

a) Absolute pressure   b) Gauge pressure   c) Vacuum pressure   d) None of these

26. The diameter of a pipe at the sections 1 and 2 are 10 cm and 15 cm respectively. Find the discharge through the pipe if the velocity of water flowing the pipe at section 1 is 5 m/s. Determine the velocity at section 2.

a) 1.5 m/s   b) 5.3 m/s   c) 2.22 m/s   d) None of these

27. The type of flow in which velocity at any given time does not change with respect to space is known as _____

a) Steady flow   b) Compressible flow   c) Irrotational flow   d) Uniform flow

28. If Reynold number is more than _____, the boundary layer is called turbulent

boundary layer.

a) 5×10^5 b) 6×10^5 c) 4×10^5 d) 5×10^4

29. Ratio of runner power to water power is known as _____

a) Mechanical efficiency   b) Hydraulic efficiency   c) Volumetric efficiency   d) Overall efficiency

30. Air vessel in a reciprocating pump is used

a) to obtain continuous supply of water at uniform rate   b) to reduce suction head   c) to increase delivery head   d) None of these

31. The work saved by fitting an air vessel to a single-acting reciprocating pump is

a) 39.2%   b) 84.4%   c) 48.8%   d) 92.3%

32. SCADA is an acronym for

a) Static Control And Data Acquisition   b) Statutory Control And Data Acquisition   c) Superior Control And Data Acquisition   d) Supervisory Control And Data Acquisition

33. The fastest adc is

a) Parallel   b) dual slope   c) successive approximation   d) Flash

34. The rate which is used for sampling theorem

a) Ohms rate   b) Nyquist rate   c) Shannon's rate   d) None of the above

35. Number of stages in PLC scan cycle

a) 2   b) 3   c) 4   d) 5

36. Ladder logic programming consists primarily of

a) text-based code   b) function blocks with connecting lines   c) logic gate symbols with connecting lines   d) virtual relay contacts and coils

37. HMI means Human Machine …………..

a) Interconnection   b) Internet   c) Interface   d) Input

38. To communicate with each member …………. topology is used

a) Point to point   b) Mesh   c) Tree   d) Star

39. Which one of the following is not a vectored interrupt?

a) TRAP.   b) INTR   c) RST 7.5.   d) RST 3.

40. Which of the following instruction is not valid?

a) MOV AX, BX   b) MOV DS, 5000H   c) MOV AX, 5000H   d) PUSH AX

41. The number of address and data lines of 8086_____.

a) 8 and 8   b) 20 and 16   c) 16 and 16   d) 16 and 20

42. 8051 series has how many 16 bit registers?

a) 2   b) 3   c) 1   d) 0

43. DJNZ R0, label is how many bit instructions?

a) 2   b) 3   c) 4   d) 1

44. What is the function of the TMOD register?

a) TMOD register is used to set different timer's or counter's to their appropriate modes   b) TMOD register is used to load the count of the timer   c) Is the destination or the final register where the result is obtained after the operation of the timer   d) Is used to interrupt the timer

45. In an open loop control system

a) Output is independent of control input   b) Output is dependent on control input   c) Only system parameters have effect on the control output   d) None of the above

46. In force-voltage analogy, velocity is analogous to

a) current   b) charge   c) inductance   d) capacitance

47. The transient response of a system is mainly due to

a) inertia forces   b) internal forces   c) stored energy   d) friction

48. Velocity error constant of a system is measured when the input to the system is unit _____ function.

a) Parabolic   b) ramp   c) impulse   d) step

49. Polar plot is between,

a) Magnitude and   b) Magnitude and   c) Phase and   d) None of the above

	frequency	phase	frequency	

50.   PI is_____

a)   camera   b)   differentiator   c)   images   d)   integrator

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