

Register No.:

Name :

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

SIXTH SEMESTER B.TECH DEGREE EXAMINATION (R), MAY 2023**ROBOTICS AND AUTOMATION****(2020 SCHEME)****Course Code : 20RBTT308****Course Name : Comprehensive Course Work****Max. Marks : 50****Duration : 75 Minutes****PART A****(Answer all questions. Each question carries 1 mark)**

- 1 A circular bar moving in a round hole is an example of
A. Incompletely constrained motion B. Partially constrained motion
C. Completely constrained motion D. Successfully constrained motion
- 2 Lower pairs are those which have
A. Point or line contact between the two elements when in motion B. Surface contact between the two elements when in motion
C. Elements of pairs not -held together mechanically D. Two elements that permit relative motion
- 3 The follower of a cam has
A. uniform acceleration and retardation B. cycloidal motion
C. simple harmonic motion D. any one of the above
- 4 A slider crank chain consists of following numbers of turning and sliding pairs
A. 1, 3 B. 2,2
C. 3,1 D. 4,0
- 5 The length of belt used in a cross-belt drive is ___ than that used in open belt drive
A. double B. equal
C. less D. greater
- 6 In a four-bar linkage, if the lengths of shortest, longest and the other two links are denoted by s, l, p and q, then it would result in Grashof's linkage provided that
A. $l+p = s+q$ B. $l + p < s + q$
C. $l-p = s+q$ D. $l+s < p+q$
- 7 The interrupt service routine for the RESET interrupt is vectored in
A. 0000H B. 0003H
C. 000BH D. 0013H
- 8 Which register is used to make the interrupt level or an edge triggered pulse?
A. TCON B. IE
C. IPR D. SCON

- 9 The program which combines small subprograms to execute the main program
 A. linker B. loader
 C. assembler D. compiler
- 10 Which pin of the external hardware is said to exhibit INTO interrupt?
 A. pin no 10 B. pin no 11
 C. pin no 12 D. pin no 13
- 11 Which instructions have no effect on the flags of PSW?
 A. ANL B. XRL
 C. ORL D. All of the mentioned
- 12 Which addressing mode execute its instructions within CPU without the necessity of reference memory for operands?
 A. Implied Mode B. Immediate Mode
 C. Direct Mode D. Register Mode
- 13 First order system is defined as :
 A. Number of poles at origin A. Order of the differential equation
 C. Total number of poles of equation C. Total number of poles and order of equation
- 14 A system is marginally stable. The poles of the system are located
 A. On the imaginary axis B. On right hand plane
 C. On the real axis D. On left hand plane
- 15 The impulse response of a LTI system is a unit step function, then the corresponding transfer function is
 A. $1/s$ B. $1/s^2$
 C. 1 D. s
- 16 The given characteristic equation $S^4 + S^3 + 2S^2 + 2S + 3 = 0$ has:
 A. Zero root in the s-plane B. One root in the RHS of s-plane
 C. Two root in the RHS of s-plane D. Three root in the RHS of s-plane
- 17 Steady state accuracy specified in terms of:
 A. Steady state error B. Damping ratio
 C. Natural frequency D. All of the mentioned
- 18 Zeroes are defined as:
 A. Roots of the denominator of the closed loop transfer function B. Roots of the numerator of the closed loop transfer function
 C. Parts of the numerator D. Parts of the denominator
- 19 Which one of the following robots with two prismatic joints?
 A. Cartesian B. Articulated
 C. Cylindrical D. None of the above
- 20 Which one of the following robots also called spherical robot?
 A. SCARA B. Delta
 C. Polar D. None of the above
- 21 In trajectory planning
 A. Cartesian scheme is preferred to joint space scheme due to less computational complexity. B. Joint space scheme is preferred to Cartesian scheme due to less computational complexity.

- C. Computational complexity of Cartesian scheme and joint space scheme is not comparable. D. Joint space scheme is never used.
- 22 The robots with the designation TRR is known as _____ robots?
 A. Spherical B. Articulated
 C. Both a and b D. None of the above
- 23 According to Denavit – Hartenberg notations, link and joint parameters represent
 A. The relative positions of neighboring links and structure of a link respectively. B. The structure of a link and relative positions of neighboring links respectively
 C. The structure of a link only D. The relative positions of neighboring links only
- 24 The joints of the robots are categorized into _____ types?
 A. one B. two
 C. three D. None of the above
- 25 Check valve may also be known as
 A. pressure reducing valve B. pressure escape
 C. directional management valve D. Directional valve
- 26 In ship manufacturing, the type of layout preferred is
 A. Product layout B. Process layout
 C. Fixed-position layout D. GT layout
- 27 Which one is the PLC programming language?
 A. HMI B. MMI
 C. FBD D. None of the above
- 28 Which of the following is an advantage of using a strain gauge over other types of force measurement sensors?
 A. High sensitivity B. Non-contact measurement
 C. Low cost D. Immunity to environmental factors
- 29 From the following which is not the application of AGV.
 A. Truck loading and unloading B. To change the tool
 C. Material transfer D. Paper roll transfer
- 30 In which layout manufacturing is done according to machine arrangement
 A. GT layout B. Product layout
 C. Process layout D. Hybrid layout

PART B

(Answer all questions. Each question carries 2 marks)

- 31 Two shafts have their axis parallel and 2.5cm apart. One of the shaft drives the other through Oldham coupling. If the speed of the shaft is 100 rpm, what is the maximum velocity of sliding in cm per minute of the intermediate disc on either of the side discs?
A. 1750 cm/min **B.** 1570cm/min

