

Program: BE Biomedical Engineering

Curriculum Scheme: Revised 2012

Examination: Fourth Year Semester VIII

Course Code: BME8012 and Course Name: Robotics in Medicine

Time: 1hour

Max. Marks: 50

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Note to the students:- All the Questions are compulsory and carry equal marks .

Q1.	Straight line trajectory in articulated robot is achieved by
Option A:	Pick and Place
Option B:	Interpolation
Option C:	Point to Point
Option D:	Bounded Deviation Algorithm
Q2.	Point[1 2 1]' is translated along X and Z axis by 3 and -2 units What is the new position
Option A:	[1 2 3]
Option B:	[4 2 -1]
Option C:	[5 2 3]
Option D:	[1 2 1]
Q3.	Swell Operator is used in images for
Option A:	Removal of isolated background pixel in foreground
Option B:	Removal of isolated foreground pixel from background
Option C:	Template matching
Option D:	Edge detection
Q4.	Which robot has work space envelop a rectangular box
Option A:	Cylindrical robot
Option B:	Spherical robot
Option C:	SCARA
Option D:	Cartesian Robot
Q5.	Zero th order moment of an image signifies
Option A:	Area
Option B:	Volume
Option C:	product
Option D:	operator

Q6.	Yaw pitch Roll represents
Option A:	Path
Option B:	Position
Option C:	Trajectory
Option D:	Tool Orientation
Q7.	Kinematic Parameters are
Option A:	Yaw parameters
Option B:	Pitch parameters
Option C:	Joint and link parameters
Option D:	Shoulder and elbow joints
Q8.	Which of the following is not workspace fixture
Option A:	Fixed Tool
Option B:	SCARA
Option C:	conveyor
Option D:	Gravity Part feeder
Q9.	For straight line motion, the speed distribution function if the movement is to be carried out in T seconds is given by
Option A:	$s(t) = \frac{1}{T}$
Option B:	$s(t) = \frac{t}{T}$
Option C:	$s(t) = \frac{T}{t}$
Option D:	$s(t) = t \cdot T$
Q10.	Work Envelop traced by Joints of the robot is
Option A:	Joint Space Work Envelop
Option B:	Total work Envelop
Option C:	Dextrous Work Envelop
Option D:	Trajectory
Q11.	Straight line trajectory is difficult in
Option A:	Articulated Robot
Option B:	Cartisian Robot
Option C:	Rectangular Robot
Option D:	Linear Robot
Q12.	Which axis is fixed first while assigning coordinate frames using DH algorithm
Option A:	x
Option B:	y
Option C:	z
Option D:	X and y

Q13.	Robotics Vision is used when the feedback sensor is a
Option A:	Proximity Sensor
Option B:	Light Sensor
Option C:	Infrared Sensor
Option D:	Camera
Q14.	A measure of spatial resolution with which tool tip can be placed in workspace of robot is
Option A:	Accuracy
Option B:	Precision
Option C:	Repeatability
Option D:	Resolution
Q15.	Solution of IKP may exist in which of the following condition
Option A:	The point is outside work envelop
Option B:	The point is inside work envelop but there is joint constraint to reach the point
Option C:	The point is inside work envelop but the point can not be reached
Option D:	The point is inside work envelop but there is no joint constraint to reach the point
Q16.	Euler number of an image defines
Option A:	No of holes in the image
Option B:	No of parts in the image
Option C:	No of parts minus the no of holes
Option D:	No of parts plus the no of holes
Q17.	Template matching works well only if
Option A:	The two images are the same
Option B:	The two images are of the same size
Option C:	The mean of the two images is the same
Option D:	The average intensity of the two images is the same
Q18.	The most general method for solving Inverse Kinematic Problem is
Option A:	Numerical Method
Option B:	Vector method
Option C:	Graphical Method
Option D:	Analytical Method
Q19.	To determine the coefficients of cubic polynomial used as a trajectory function ,we need to know
Option A:	4 known conditions
Option B:	3 known conditions
Option C:	2 known conditions
Option D:	5 known conditions

Q20.	Generalized Voronoi Diagram(GVD) is for -----motion planning
Option A:	Fine
Option B:	Gross
Option C:	Grasp
Option D:	Work envelop
Q21.	Run Length encoding for the given binary image I = $\begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \\ 0 & 0 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$
Option A:	1,0,7,8
Option B:	0,0,1,7,0,0
Option C:	0,1,7,8
Option D:	0,0,1,5,0,6
Q22.	Which of the following is not a part of path planning
Option A:	Gross motion planning
Option B:	Fine Motion Planning
Option C:	Perspective
Option D:	Grasp Planning
Q23.	$TCV = \begin{bmatrix} w^1 \\ w^2 \end{bmatrix}$ what is w^1
Option A:	Orientation vector
Option B:	Position vector
Option C:	Amplitude
Option D:	Direction
Q24.	Stroke of a robot is
Option A:	Distance between min and max reach
Option B:	reach
Option C:	Min reach
Option D:	orientation
Q25.	Surgical cuts in microsurgery are smaller than with traditional open surgery. Benefits include:
Option A:	Faster recovery; Less pain and bleeding
Option B:	Cheap
Option C:	Complicated
Option D:	More hospital stay