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KPSC Tradesman

**Previous Year Paper
Biomedical Engg.
10 Jun, 2015**



109/2015

Maximum : 100 marks

Time : 1 hour and 15 minutes

1. Ultrasonic blood flow meter is based on the principle of :
(A) Transmission (B) Conductivity
(C) Induction (D) Transit time
2. The normal pH of blood is :
(A) 7 (B) 7.4
(C) 6.6 (D) 7.8
3. Plethysmograph for measuring total lung capacity is based on :
(A) Electromagnetic conduction (B) Faraday's law of induced emf
(C) Boyle's law (D) Flemings right hand rule
4. Cardiac output is the amount of blood delivered by the heart to the aorta per :
(A) Minute (B) Second
(C) Hour (D) Cycle
5. The Non-invasive method of Blood flow measurement :
(A) Angiogram (B) Coulter counter
(C) Electromagnetic blood flow meter (D) Pneumotachograph
6. During myocardial infraction, one can use :
(A) Pace maker (B) Heart lung machine
(C) Nerve stimulator (D) Kidney machine
7. Ground faults can be avoided by using :
(A) 3 pin plug system (B) Isolated power supply
(C) Fuses in the circuit (D) Pure D.C. alone
8. The instrument for administering the electric shock is called :
(A) Ventillators (B) Pace maker
(C) Stimulators (D) Defibrillators

A

3

[P.T.O.]

9. The order of imaging methods (from worst to best) with respect to visibility of detail (resolution) is:
- (A) Gamma camera, fluoroscopy, CT
 - (B) Ultrasound, fluoroscopy, radiography
 - (C) Gamma camera, fluoroscopy, MRI
 - (D) Radiography, fluoroscopy, MRI
10. Ventricular asynchronous pacemaker is also called as :
- (A) Fixed rate pace maker
 - (B) Demand pace maker
 - (C) Internal pace maker
 - (D) Inhibited pace maker
11. In biotelemetry, the type of modulation employed is :
- (A) Amplitude modulation
 - (B) Pulse modulation
 - (C) Frequency modulation
 - (D) Phase modulation
12. What type of electrodes is more often employed in EMG work?
- (A) Needle electrodes
 - (B) Surface electrodes
 - (C) Floating electrodes
 - (D) Limb electrodes
13. The T wave is produced during :
- (A) Depolarization of the ventricles
 - (B) Atrial repolarization
 - (C) Repolarization of the ventricles
 - (D) Atrial depolarization
14. Which is not a component of the extracorporeal circuit?
- (A) Blood pump
 - (B) Blood leak detector
 - (C) Heparin infusion line
 - (D) Drip chamber
15. The basic requirements of a biomedical amplifier is/are:
- (A) High input impedance and high gain
 - (B) Limited bandwidth and high signal to noise ratio
 - (C) High Common mode rejection ratio
 - (D) All of the above
16. For the standard Bipolar lead system the R-wave amplitude will be :
- (A) Lead II = Lead I + Lead III
 - (B) Lead I = Lead II + Lead III
 - (C) Lead III = Lead I + Lead II
 - (D) None of the above

17. Which of the following is not a laser property?
(A) Highly monochromatic (B) High directionality
(C) Very narrow bandwidth (D) Highly divergent
18. X-ray machine anode is rotated to :
(A) Reduce dosage (B) Increase image intensity
(C) Increase focal spot area (D) All of the above
19. In an endoscope the image transfer is done using :
(A) Non- Coherent bundle (B) Coherent bundle
(C) Both of these (D) None of these
20. A- scan is used to :
(A) Image moving objects (B) Find depth and size of organs
(C) Image bones (D) Detect cancerous cells
21. The graphic record of heart sound is called :
(A) Cardiogram (B) Ballistogram
(C) Phonogram (D) Vector cardiogram
22. Which modality does not use a form of ionizing radiation?
(A) Sonography (B) Computed tomography
(C) Radiography (D) Positron emission tomography
23. The presence of noise in a medical image will generally:
(A) Produce artifacts
(B) Produce blurring
(C) Reduce visibility of low contrast objects
(D) Produce image distortion
24. Emission of a photon by an excited atom due to interaction of external energy is called:
(A) Spontaneous emission (B) Stimulated emission
(C) Induced absorption (D) Light amplification
25. Which of the following characteristics of an ultrasound pulse does not change when it pass through tissues?
(A) Amplitude (B) Velocity
(C) Wavelength (D) Frequency

26. Diagnostic ECG recording requires a band width of :
- (A) 0.05 to 100 Hz (B) 50 to 60 Hz
(C) 5 to 40 Hz (D) 5 to 100 Hz
27. Match the following :
- | | |
|--------------------------|----------------------------------|
| (a) Controlled breathing | 1. patient initiated breathing |
| (b) Assisted breathing | 2. Automatically timed breathing |
| (c) Assist control mode | 3. Servo controlled ventilators |
- (A) a-1, b-2, c-3 (B) a-2, b-3, c-1
(C) a-3, b-1, c-2 (D) a-2, b-1, c-3
28. Piezoelectric effect is the production of electricity by:
- (A) Chemical effect (B) Pressure
(C) Varying field (D) Temperature
29. The basic principle of a mass spectrometer is:
- (A) Sorting ions according to charge/mass ratio
(B) Sorting ions by atomic weight
(C) Based on light absorbance
(D) Based on light spectrum
30. The maximum field strength used in MRI is:
- (A) 1.3 T (B) 0.3 T
(C) 1.0 T (D) 1.5 T
31. The most commonly used anesthetic is :
- (A) Nitrous oxide in combination with fluorocarbons
(B) Hydrous oxide in combination with fluorocarbons
(C) Nitrous oxide in combination with hydrocarbons
(D) Nitrous oxide
32. Choose the group below that contains the dialysate delivery system monitors :
- (A) Temperature, venous pressure, flow rate
(B) Blood and dialysate flow rates
(C) Conductivity, pH, flow rate
(D) Blood leak, pH, arterial pressure

33. The concentration of calcium, sodium and potassium ions in blood is determined by:
(A) Ultrasonic Doppler meter (B) pH meter
(C) Blood gas analyzer (D) Flame photometry
34. The room housing the MRI machine is typically lined with:
(A) Copper (B) Lead
(C) Iron (D) Tin
35. NMR uses gyromagnetic property of:
(A) Electron (B) Proton
(C) Positron (D) Neutron
36. Maximum radiation exposures is caused by:
(A) Sonography (B) CT scan
(C) Chest x-ray (D) MRI
37. The fluid on MRI appears as:
(A) Black on T1 W images (B) White on T2W images
(C) Intermediate on both images (D) A, B are true
38. For a patient with occasional QRS complex the right time to deliver electric shock is:
(A) Before QRS complex (B) After QRS complex
(C) On leading edge (D) On trailing edge
39. The blood does not clot inside human body due to the presence of:
(A) Fibrin (B) Heparin
(C) Haemoglobin (D) Thromboplastin
40. Which is the device used for recording foetal heart sounds?
(A) Tachometer (B) Vector Cardiograph
(C) Phonocardiograph (D) None of the above
41. The haemodynamic pressure values of the venous system is:
(A) 6 - 25 mmHg (B) 30 - 300 mmHg
(C) 80 - 120 mmHg (D) 5 - 15 mmHg

42. Ambulatory monitoring is used for:
- (A) ECG monitoring (B) Pressure monitoring
(C) Both of these (D) None of these
43. Oximetry is measurement of:
- (A) Oxygen saturation of arterial blood
(B) Oxygen saturation of venous blood
(C) Oxygen exchange in lungs
(D) Oxygen level in expired air
44. Coulter counter is based on:
- (A) Microscopic analysis (B) Optical analysis
(C) Electrical conductivity (D) All of the above
45. Audiometers used for identification of:
- (A) Vision problems (B) Hearing loss
(C) Both of these (D) None of these
46. The vulnerable period for ventricular muscle is:
- (A) Up stroke of T wave (B) QRS complex
(C) ST interval (D) P wave
47. The filter commonly used in biomedical instruments is:
- (A) High pass filter (B) Low pass filter
(C) Notch filter (D) All pass filter
48. The term fulguration refers to:
- (A) Tissue coagulation using local heating
(B) Superficial tissue destruction without bleeding
(C) Deep tissue destruction without bleeding
(D) Local tissue heating
49. The operating frequency of solid state diathermy machine is:
- (A) 250 KHz - 1 MHz (B) 1 MHz - 3 MHz
(C) 3 - 30 MHz (D) 20 - 200 KHz

50. In LASER pumping is for:
- (A) Switching the device on (B) Cooling the device
(C) Changing mode (D) Activating the medium
51. The term TENS stands for:
- (A) Temporary electrical nerve stimulator
(B) Transparent electrode nerve stimulator
(C) Transcutaneous electrical nerve stimulator
(D) Transcutaneous electrode nerve stimulator
52. The filter unit present in Kidney is:
- (A) Neuron (B) Nephron
(C) Nerve fibre (D) Capillaries
53. Extra corporeal Shock Wave Lithotripsy is:
- (A) A non invasive treatment for cancer
(B) A non invasive treatment for kidney stone
(C) An invasive treatment for abdominal problems
(D) An invasive treatment for neural dysfunction
54. Which of the following is not included as part of ventilator?
- (A) Humidifier (B) Nebulizer
(C) Aspirator (D) Defibrillator
55. Short wave diathermy is used for:
- (A) Deep heating of tissues (B) Surgery
(C) Cancer treatment (D) None of the above
56. In Closed loop control systems:
- (A) Measure the effectiveness of treatment
(B) Automation is possible
(C) Less risk of over dosages
(D) All of the above
57. The normal blood glucose level of a healthy person:
- (A) Below 125 mg/dl (B) Above 125 mg/dl
(C) Between 150 - 300 mg/dl (D) Between 25 - 75 mg/dl

58. Find the true statement about angiogram:
- (A) Imaging of arterial blood vessels
 - (B) Treatment technique for blood vessels
 - (C) Angioplasty and angiogram are the same
 - (D) None of the above
59. The type of waveform used to deliver shock pulse in a defibrillator:
- (A) Square wave
 - (B) Rectangular wave
 - (C) Damped sinusoidal
 - (D) Undamped sinusoidal
60. Systemic Circulation means circulation of blood through:
- (A) Any one body system
 - (B) An external device
 - (C) Lungs
 - (D) All parts of body
61. The part of the brain which helps to maintain body balance is:
- (A) Brain stem
 - (B) Cerebellum
 - (C) Spinal cord
 - (D) Cerebrum
62. The features of light used for theater lighting is:
- (A) Shadow less
 - (B) Low IR content
 - (C) White light
 - (D) All of the above
63. In a hospital the color codes used for oxygen gas supply line is:
- (A) Blue
 - (B) White
 - (C) Yellow
 - (D) Black
64. The sensing probes of a digital thermometer is:
- (A) Diode sensor
 - (B) Mercury
 - (C) Thermistor
 - (D) None of the above
65. An optocoupler is used for:
- (A) Isolation of patient circuit
 - (B) Photo detection
 - (C) Signal amplification
 - (D) Filtering signal
66. An example for ambulatory ECG monitoring is:
- (A) Tread mill test
 - (B) Bicycle test
 - (C) Holter cardiography
 - (D) Echocardiography

67. Telemedicine refers to:
(A) Teleconsultation (B) Telepathology
(C) Tele- education (D) All of the above
68. A pneumotachometer measure:
(A) Volume of respired gases (B) Volume of blood flowing out of heart
(C) Heart rate (D) Respiratory rate
69. Clark electrode is:
(A) Reference electrode (B) pO₂ electrode
(C) pCO₂ electrode (D) pH electrode
70. Optic fibre cable works on the principle:
(A) Total internal absorption (B) Interference
(C) Total internal reflection (D) Refraction
71. The extinction coefficient for oxygenated and reduced haemoglobin are same at:
(A) 650 nm (B) 400 nm
(C) 705 nm (D) 805 nm
72. Which type blood cells help in coagulation?
(A) Platelets (B) Lymphocytes
(C) Neutrophils (D) Erythrocyte
73. Electrical hazards of ESU are:
(A) Burns (B) High frequency current
(C) Explosion (D) All of the above
74. Ultrasonic transducers are based on:
(A) Chemical effect (B) Piezoelectric effect
(C) Varying electric field (D) Temperature
75. The purpose of compensation for a thermocouple is:
(A) To decrease temperature sensitivity
(B) To increase voltage output
(C) To cancel unwanted voltage output of a thermocouple
(D) Used for high-temperature circuits

76. The average value of systolic and diastolic pressure of normal adult are:
(A) 80 mm Hg and 120 mm Hg (B) 120 mm Hg and 80 mm Hg
(C) 70 mm Hg and 140 mm Hg (D) 140 mm Hg and 60 mm Hg
77. The Cobalt 60 machine is used:
(A) For laser treatment (B) Medical imaging
(C) Radiotherapy (D) Diagnosis of cancer
78. Insulin pump is used by patients with:
(A) Diabetics (B) High cholesterol level
(C) Both of these (D) None of these
79. The laser used as photo coagulator:
(A) CO₂ laser (B) Nd - YAG laser
(C) Argon laser (D) He - Ne laser
80. An endoscope is used:
(A) For scanning all body parts (B) To image all internal organs
(C) For treatment of cancer (D) To view hollow internal organs
81. Social Reformer of Kerala who proclaimed 'No Caste, No Religion and No God for Human being':
(A) Sree Narayana Guru (B) Nataraja Guru
(C) Mannath Padmanabhan (D) Sahodaran Ayyappan
82. Mahatma Gandhi was mostly influenced the idea of 'civil disobedience' by the American writer :
(A) Leo Tolstoy (B) Ruskin Bond
(C) Henry David Thoreau (D) Neerad C. Choudari
83. Bhagat Singh was associated with :
(A) Lahore conspiracy case (B) Meerat conspiracy case
(C) Cannpore conspiracy case (D) Kakori conspiracy case

84. The main venue of salt sathyagraha in Malabar was :
- (A) Calicut beach (B) Payyanur beach
(C) Thalassry beach (D) Alappuzha beach
85. Mahatma Gandhi hailed which historic document as a 'miracle of modern times' :
- (A) Ezhava memorial (B) Malayali memorial
(C) Temple entry proclamation (D) Kundara proclamation
86. The Bhoodan leader Vinobha Bhava inaugurated The Bhoodan Movement in :
- (A) Maharastra (B) Bihar
(C) West Bengal (D) Thelungana
87. Punnapra – Vayalar incident happened in the year:
- (A) 1942 (B) 1946
(C) 1947 (D) 1948
88. First president of All India Kissan Sabha – AIKS was :
- (A) Swami Sahajananda (B) Jaya Prakash Narayan
(C) B.P. Wadia (D) Indulal Yagnik
89. The Aika Kerala conference held at Trichur in April 1947 under the presidentship of :
- (A) K. Kelappan (B) K.P. Kesava Menon
(C) Sree Kerala Varma (D) T.M. Varghese
90. Incident happened on November 10, 1921 associated with Malabar Rebellion was :
- (A) Black hole tragedy (B) Wagon tragedy
(C) Amruthsar tragedy (D) Perumon tragedy
91. In 1940 on March 13 Udam Singh a sikh youth killed:
- (A) Sanders (B) Hunder
(C) Michal O' Dyer (D) General Dyer
92. Who coined The Slogan 'India for Indians'?
- (A) Rajaram Mohan Roy (B) Iswara Chandra Vidyasagar
(C) Swami Vivekananda (D) Dayanantha Saraswathy

93. Owner of 'Swadeshabhimani' periodical :
- (A) K. Ramakrishna Pillai (B) P. Krishna Pillai
(C) Vakkam Abdul Kadhar Maulavi (D) K.P. Kesava Menon
94. Dr. K.B. Menon was associated with :
- (A) Kizhariyur bomb case (B) Mumbai bomb case
(C) INA (D) Punnapra Vayalar
95. The first All Kerala political conference attended by delegates from different parts of Kerala was held at Ottapalam under the presidency of :
- (A) K.P. Kesava Menon (B) T. Prakasam
(C) Dr. Annie Besant (D) C. Sankaran Nair
96. The Indian National Congress adopted the goal of socialistic pattern at the :
- (A) Nagpur session (B) Bombay session
(C) Jaipur session (D) Avadi session
97. The first general election to the Kerala state legislature were held in :
- (A) 1956 (B) 1957
(C) 1955 (D) 1954
98. 'Rammohan Roy was the only person in his time, in the whole world of man, to realize completely the significance of The Modern Age'. This statement is attributed to :
- (A) Bal Gangadhar Tilak (B) Ravindranath Tagore
(C) Subhash Chandra Bose (D) Mahatma Gandhi
99. Clement Attlee's historic announcement to Quit India was on :
- (A) June 3, 1947 (B) June 4, 1947
(C) July 4, 1947 (D) February 20, 1947
100. Who was the captain of the volunteer corps of Guruvayoor Sathyagraha?
- (A) Subramaniam Thirumalan (B) K. Kelappan
(C) A.K. Gopalan (D) E.M.S