Q.1 The only abductors of the vocal cords are the

(A) Posterior cricoarytenoid muscles

(B) Inter arytenoid muscles

(C) Cricothyroid muscles

(D) Lateral crico arytenoid muscles

Q.2 Which of the following is NOT a content of the axilla?

(A) Axillary artery (and branches)

(B) Cephalic vein

(C) Axillary nerve

(D) Subclavian vein

Q.3 Which of the following is NOT a content of the spermatic cord?

(A) Testicular artery

(B) Femoral artery

(C) Cremasteric artery

(D) Ductus deferens artery

Q.4 Which of the following statements regarding the arterial blood supply of the rectum are correct?

(A) The principal blood supply of the rectum is from the inferior rectal artery

(B) The superior rectal artery crosses the ureter anterior to the bifurcation of the left common iliac artery

(C) The inferior rectal artery has few anastomoses with the middle and superior rectal arteries

(D) The inferior mesenteric artery becomes the superior rectal artery on crossing the pelvic brim

Q.5 Which of the following describe the term “Mean Corpuscular Hemoglobin Concentration”?

(A) Average mass of hemoglobin per red blood cell in a sample of blood

(B) Average concentration of hemoglobin in a given volume of packed red blood cells

(C) Ratio of the volume of red blood cells to the total volume of blood

(D) None of the above

Q.6 One of the following is INCORRECT regarding the phases of cardiac cycle:

	Phase	Status of AV valves	Status of semilunar valves
A	Atrial systole	Open	Closed
B	Isovolumetric contraction	Closed	Closed
C	Ventricular ejection	Closed	Open
D	Isolvolumetric relaxation	Open	Open

(A) A

(B) B

(C) C

(D) D

Q.7 What happens when someone takes out-dated tetracyclines?

(A) No action since the drug has lost its efficacy

(B) Reversible kidney damage

(C) Reversible liver damage

(D) The drug will still be effective without any major side-effects

Q.8 Ivermectin is known to cause tonic paralysis of nematodes by its action through glutamate gated chloride channels and potentiation of GABAergic transmission. Based on this statement which of the following is TRUE?

(A) Side-effects of the drug on humans are mediated through the same mechanism

(B) Single dose should be avoided to prevent sudden serious GABAergic side-effects in humans

(C) GABA-related activities in humans are minimal owing to its low affinity and P-glycoprotein mediated efflux at blood brain barrier of the drug

(D) None of the above

Q.9 Obesity should be managed with diet and exercise. When diet and exercise do not work alone, they should be used in combination with pharmacotherapy. Identify the drug that is ineffective as pharmacotherapy for obesity:

(A) Anti-histaminics

(B) Orlistat

(C) Phentermine

(D) Amphetamine

Q.10 Methicillin resistance in *Staphylococcus aureus* is imparted by:

(A) Production of beta-lactamase

(B) Presence of van A gene

(C) Production of TSST-I

(D) Presence of Staphylococcal cassette chromosomal mec genes (SCC mec)

Q.11 Transfer of single electron to O_2 generates the potentially damaging superoxide anion free radical which gives rise to free-radical chain reaction, amplifying its destructive effects. The enzyme responsible for its removal in all aerobic organisms is:

(A) Superoxide reductase

(B) Superoxide dismutase

(C) Oxydase

(D) Hydrolase

Q.12 Which of the following enzyme is present in the inter-membranous space of mitochondria?

(A) ATP synthase

(B) Adenylyl kinase

(C) Acyl-CoA synthase

(D) Glycerolphosphate acyltransferase

Q.13 Which of the following diseases is associated with deficiency of Glucose-6-phosphatase deficiency?

(A) Von Gierke disease

(B) Pompe disease

(C) Forbe disease

(D) Tarui disease

Q.14 The first step in β-oxidation is the removal of two hydrogen atoms from the 2(α)- and 3(β)-carbon atoms and this reaction is catalysed by:

(A) Acyl-CoA dehydrogenase

(B) Thiolase

(C) Acyl-CoA synthase

(D) Pyruvate kinase

Q.15 Restriction enzymes are:

(A) Exonucleases that progressively digest from the ends of DNA molecules

(B) Endonucleases that cut DNA at specific DNA sequences within the molecule

(C) Atypical enzymes which damages DNA

(D) These are not enzymes, but digestive chemicals designed in lab to break non-coding RNA molecules

Q.16 Epitheloid cells are:

(A) Activated macrophages

(B) Epithelial cells that look like WBCs

(C) Neutrophils

(D) RBCs

Q.17 One of the following is NOT an Interferon Gamma Release Assay (IGRA):

(A) QuantiFERON®-TB

(B) T-SPOT®.TB

(C) ELISA measurement of IFN-γ produced in response to three M. tuberculosis antigens (ESAT-6, CFP-10, and TB7.7)

(D) Mantoux test

Q.18 Selective media for growing *Neisseria meningitidis*:

(A) Blood Tellurite media

(B) Mueller-Hinton media

(C) Modified Thayer-Martin media

(D) MacConkey media

Q.19 A mother takes her previously healthy 6 year old daughter to the medicine department after observing that she was appearing "puffy". The doctor observed bilateral pitting edema in lower limbs and swelling of her eyelids. Urinalysis revealed a pH of 5 with grade 4+ proteinuria; glucose and ketones are absent. What is most likely the cause of the patient's edema?

(A) Congestive heart failure

(B) A thickening of the glomerular basement membrane

(C) Loss of negative charge in the glomerular filtration barrier

(D) Inadequate dietary protein

Q.20 What should be the first choice of treatment for a case of progressive prolongation of QRS complex (more than 100 millisec) due to overdose of tricyclic antidepressants?

(A) Cardiac pacemaker

(B) IV atropine

(C) IV sodium bicarbonate

(D) IV Physostigmine

Q.21 Rape is defined under which of the following sections of the Indian Penal Code (IPC)

(A) Section 320

(B) Section 375

(C) Section 305

(D) Section 325

Q.22 A pregnant lady visits the Obstetrics emergency with contractions. Upon manual vaginal examination the following findings were observed - cervical dilation: 2cm; effacement: 40%; station: -2; consistency: medium and position: mid. Calculate the Bishop's score:

(A) 4

(B) 5

(C) 8

(D) 10

Q.23 In a cephalic presentation, the position is determined by the relationship of what fetal part to the mother’s pelvis?

(A) Mentum

(B) Sacrum

(C) Occiput

(D) Sinciput

Q.24 Accidental damage to which of the structures during hysterectomy may result in severe disruption of blood flow to the ipsilateral ovary?

(A) Suspensory ligament

(B) Round ligament

(C) Cardinal ligament

(D) None of the above

Q.25 A 28-year-old woman comes for her first antenatal visit at 28 weeks' gestation. Her history and physical examination are normal except for the presence of a 2-cm posterior cervical leiomyoma. The patient is relatively asymptomatic. Which of the following is the best management for this patient?

(A) Myomectomy at 36 weeks

(B) Progesterone therapy to decrease the myoma size

(C) Elective cesarean delivery at term

(D) Watchful waiting

Q.26 A 14-year-old girl is brought into the office by her mother because of a concern of a lack of menarche. Her mother is worried that something is wrong since she has not started menstruating. Based on a complete history and limited physical and thorough application of a knowledge of normal pubarche changes, you may be able to calm the mother. Which of the following occurs earliest in preadolescent girls entering puberty?

(A) Axillary hair growth

(B) Thelarche

(C) Menarche

(D) Pubic hair growth

Q.27 A recurrent bilateral conjunctivitis occurring with the onset of hot weather in young boys with symptoms of burning, itching, and lacrimation with large flat topped cobble stone papillae raised areas in the palpebral conjunctiva is

(A) Trachoma

(B) Phlyctenular conjunctivitis

(C) Mucopurulent conjunctivitis

(D) Vernal keratoconjuctivitis

Q.28 With regard to the human lens, which statement is LEAST likely to be correct?

(A) Major intrinsic protein of lens fibre-26 (aquaporin O) organizes the packing of crystallins in lens fibre cells

(B) Secondary lens fibre cells lose their cytoplasmic organelles during differentiation

(C) Secondary lens fibre cells lose their nuclei during differentiation

(D) The lens capsule is a basement membrane

Q.29 A 52-year-old man is involved in a motor vehicle crash and sustains severe head injuries and blunt abdominal trauma. Although the person is hemodynamically stable, his urine output is low in spite of repeated fluid resuscitation give. Lab reports indicate the patient is hyponatremic; however, his urinary sodium levels were found to be elevated. Which of the following is the best line of initial treatment?

(A) Demeclocycline

(B) Hypertonic saline

(C) Furosemide

(D) Fluid restriction

Q.30 Which of the following is an indication for radioiodine treatment?

(A) Relapsed Graves' disease

(B) Thyrotoxicosis in young children

(C) Severe ophthalmopathy

(D) Pregnancy and lactation

Q.31 Which of the following is not a predisposing factor for a hernia?

(A) Chronic obstructive pulmonary disease

(B) Obesity

(C) Urinary stones

(D) Peritoneal dialysis

Q.32 Which of the following statement is false?

(A) Perforation proximal to an obstruction is associated with severe generalised peritonitis.

(B) Stimulation of peristalsis helps in localisation of peritonitis.

(C) The greater the virulence of the organism, the lesser the chance of localisation.

(D) Systemic inflammatory response syndrome (SIRS) is a late manifestation of peritonitis.

Q.33 Which of the following statements regarding investigations in dysphagia are false?

(A) Barium swallow is the investigation of choice in GORD.

(B) Flexible oesophagogastroduodenoscopy (OGD) is the initial investigation of choice in suspected carcinoma.

(C) Endosonography (EUS) should be carried out when a carcinoma is seen in the oesophagus.

(D) Oesophageal manometry should be done when motility disorder is suspected.

Q.34 Which of the following statements are false with regard to necrotising fasciitis?

(A) This is a surgical emergency.

(B) It is a polymicrobial synergistic infection.

(C) To confirm the diagnosis a plain X-ray is done to look for air.

(D) A period of observation is advisable to see if the condition spreads.

Q.35 In breast carcinoma, which one of the following statements is false?

(A) Ductal carcinoma is the most common variant.

(B) There may be a combination of lobular and ductal features.

(C) Colloid, medullary and tubular carcinomas carry a poor prognosis.

(D) Paget's disease is a superficial manifestation of an underlying breast carcinoma.

Q.36 The sense organ of hearing is:

(A) Organ of Corti

(B) Cristae

(C) Macula

(D) None of the above

Q.37 Which of the following conditions may reveal a negative Rinne's test?

(A) Presbycusis

(B) CSOM

(C) Labyrinthitis

(D) Meniere's disease

Q.38 The total number of cases of a disease in a given population at a given time is referred to as:

(A) Incidence

(B) Prevalence

(C) Occurrence

(D) Probability

Q.39 Which of the following statements is true for a negatively skewed data?

(A) Mean>Median>Mode

(B) Mean<Median<Mode

(C) Mean=Median=Mode

(D) There is no order of arrangement between mean, median and mode

Q.40 When examining the hip, Thomas' test detects:

(A) True leg length discrepancy

(E) Fixed flexion of the hip

(B) Weakness of hip flexors

(C) Weakness of abductor muscles

Q.41 When performing a neurological examination, an MRC power grade of 2 indicates:

(A) No movement

(B) Movement with gravity eliminated

(C) Mild weakness

(D) Full power

Q.42 Necrosis of what type of cells lead to surfactant abnormalities in the pathogenesis of acute lung injury and acute respiratory distress syndrome?

(A) Type 1 alveolar pneumocyte

(B) Type 2 alveolar pneumocyte

(C) Alveolar macrophage

(D) Bronchial epithelial cells

Q.43 In centriacinar or centrilobular empysema what part of the airway is affected?

(A) the respiratory bronchiole to the terminal blind alveoli

(B) proximal portion of the acinus

(C) terminal alveoli in the lower zones of the lung

(D) central or proximal parts of the acini formed by respiratory bronchioles

Q.44 Lymphomas of mucosa-associated lymphoid tissue (MALT) or MALTomas in the stomach are associated with which of the following?

(A) fresh water swimming

(B) chronic ascaroides infection

(C) *H. pylori* infection

(D) HPV infection

Q.45 Invasive pancreatic cancers

(A) have cure rate of 95%

(B) typically are found in the tail of the pancreas

(C) do not have genetic alterations

(D) arise from well defined noninvasive precoursor lesions in small ducts referred to pancreatic intraepithelial neoplasia (PanIN)

Q.46 In post streptococcal glomerulonephritis immunofluorescent stains demonstrate

(A) coarsely granular deposits of complement protein corresponding to humps

(B) collapsed glomerular tufts and crescent shaped masses

(C) wrinkling of basement membrane

(D) focal segmental sclerosis in glomeruli

Q.47 What lies directly above the tentorium?

(A) the cerebellum

(B) the frontal lobes

(C) the occipital lobe

(D) the parietal lobe

Q.48 What brain states are gamma waves associated with?

(A) sleep

(B) concentration

(C) deeply relaxed

(D) anxiety

Q.49 Under normal physiologic situations when the thyroid hormones T4 is low you expect which of the following?

(A) TSH is low and TRH is high

(B) TSH is low and TRH is low

(C) TSH is high and TRH is low

(D) TSH is high and TRH is high

Q.50 Thermal homeostasis is regulated by

(A) temperature sensitive neurons in the pituitary

(B) temperature sensitive neurons in the adrenal gland

(C) temperature senstive neurons in the hippocampus

(D) temperature sensitive neurons in the hypothalamus

Q.51 Remdesivir is being used to treat COVID-19. What is it?

(A) betalactam antibiotic

(B) antiviral protease inhibitor

(C) an antinflammatory agent

(D) an inhibitor of viral RNA dependent RNA polymerase

Q.76 *Suppose $a+3i$ is a root of the quadratic equation $ix^2-2x+15i=0$, where a is a real number. Then $a=$*

(A) -2

(B) -1

(C) 0

(D) 3

Q.77 Let ω_5 be a complex 5^{th} root of unity. Then $\omega_5^3+\omega_5^2+\omega_5+2+\omega_5^{-1}=$

(A) 1

(B) 0

(C) 2

(D) 5

Q.78 Let α,β be the roots of the quadratic equation $x^2-(a+2)x+(a+5)=0$, where a is a real number. Suppose both α,β are complex but not real numbers. Then

(A) $a\in[4,20]$

(B) $a=4$

(C) $a\in(5,10)$

(D) $a\in(-4,4)$

Q.79 The $5^{th}, 6^{th}$ terms in a Harmonic progression are $\frac{1}{3}$, $-\frac{1}{7}$ respectively. Then its 101^{th} terms is equal to

(A) $-\frac{1}{597}$

(B) 0

(C) $\frac{1}{97}$

(D) $-\frac{1}{957}$

Q.80 The sum of the first 10 terms of the sequence $3, -6, 12, -24, \ldots\ldots$ is

(A) 1000

(B) -1023

(C) 2020

(D) -550

Q.81 The equation of the straight line having slope equal to the slope of the line $2x - y + 5 = 0$ and passing through the point $(-3, 5)$ is

(A) $x + 2y - 7 = 0$

(B) $2x - y + 11 = 0$

(C) $x + y - 3 = 0$

(D) $2x - 3y - 3 = 0$

Q.82 The equation of the straight line passing through the point of intersection of the lines $x - 7y - 2 = 0, -2x + 3y - 7 = 0$ and makes an angle of inclination of 45^o with the x-axis is

(A) $x - y + 4 = 0$

(B) $-x + y + 4 = 0$

(C) $2x - 2y - 7 = 0$

(D) $x + 3y - 5 = 0$

Q.83 The perpendicular distance from the point $(1, -5)$ to the line $4x - 3y - 15 = 0$ is equal to the perpendicular distance from the point $(\alpha, 2)$ to the line $x + y - 2 = 0$, where α is a real number. Then $\alpha =$

(A) $\pm\frac{\sqrt{2}}{5}$

(B) 0

(C) $\pm\frac{4\sqrt{2}}{5}$

Q.91 Which of the following reactions will undergo an S_N1 reaction?

(A) 1-bromopropane with ethanol

(B) 2-bromo-4-methylpentane with LiBr

(C) t-butyl bromide with ethanol

(D) 1-iodo-3-methyl pentane with KOH

Q.92 The α-helix structure of a protein is stabilised by

(A) dipole-dipole interactions

(B) peptide bonds

(C) van der Waals forces

(D) hydrogen bonds

Q.93 Aldehydes react with tollen's reagent to form:

(A) Silver mirror

(B) White-red

(C) Yellow or red ppt

(D) Brick red

Q.94 During the formation of a chemical bond, the free energy

(A) cannot say, depends on the system

(B) always remains constant

(C) always increases

(D) always decreases

Q.95 In polysaccharides, monosaccharides are joined by

(A) peptide bond

(B) glucose bond

(C) hydrogen bond

(D) glycosidic bond

Q.96 For making a buffer solution of pH higher than seven, we use

(A) strong acid and strong base

(B) weak acid and it's salt with the strong base

(C) weak acid and strong base

(D) weak acid and strong base

Q.97 Primary, secondary, and tertiary amines may be separated by using

(A) sulphonyl chloride

(B) benzene

(C) diethyl oxalate

(D) acetyl chloride

Q.98 Which is the correct symbol for an alpha particle?

(A) $^{1}n_{0}$

(B) $^{0}e_{-1}$

(C) $^{4}He_{2}$

(D) $^{1}p_{1}$

Q.107 *Starting from rest, a crane fly can attain a speed of 3.1 m/s in 0.03 sec. The mass of the fly is about 2.0 gm. The average power output of its body is*

(A) 0.003 W

(B) 0.320 W

(C) 3.20 W

(D) 320 W

Q.108 *A nurse measures the heart beat of a patient in terms of number of beats measured per minute as 75. The patient converts it in terms of time period in second as*

(A) 0.8 sec

(B) 1.25 sec

(C) 3.75 sec

(D) 75 sec

Q.109 *One end of a massless spring is mounted on a wall horizontally. By attaching a mass at the other end and pulling it sideways one finds that the motion of the spring-mass system follows the Hooke's law, and a force of 4 N causes a displacement of 0.02 m. He then attaches a 2 kg body to the free end, pull it aside and release it. The time period of oscillation will be*

(A) 0.006 sec

(B) 0.1 sec

(C) 0.06 sec

(D) 0.63 sec

Q.119 *In a photoelectric effect experiment, the stopping potentials of wavelengths 300 nm and 400 nm are 3 V and 2 V, respectively. [Given Planck's constant $h=6.64\times10^{-34}$ J.s, speed of light $c=3\times10^{8}$ m.s^{-1}, electronic charge $e=1.6\times10^{-19}$C]. The work function of the material is*

(A) 4 eV

(B) 3 eV

(C) 2 eV

(D) 1 eV

Q.120 *The radionuclide of ^{128}I is often used medically as a tracer in the treatment of thyroid gland. The decay rate R of ^{128}I changes from 392 counts/sec to 161 counts/sec in 32 mins. The disintegration constant of ^{128}I is*

(A) 0.0278 min^{-1}

(B) 0.496 min^{-1}

(C) 1.22 min^{-1}

(D) 7.22 min^{-1}

END OF THE QUESTION PAPER