



马来西亚留台成功大学校友会

主 办

2013 年

第三十届全国华文独中数理学识比赛

考生指示：

- (一) 解答所有问题。
- (二) 将正确答案在答案纸上的圆圈内「塗黑」，每题只准给一个答案。
- (三) 正确的答案得三分，错误的答案扣一分，不做答的零分。

INSTRUCTIONS TO CANDIDATES

1. Attempt all questions.
2. Pick the correct answer and make a mark “X” in the circle provided in the answer sheet. Only one answer is allowed for each question.
3. Three marks for a correct answer, one mark will be deducted for each wrong answer. No mark will given to each question not attempted.

- 下列何者为脊椎动物的特征?
 - 含有头骨
 - 主干含有脊椎骨
 - 会走动
 - 以上皆是
 - a 与 c 皆对
- 在怀孕时期, 下列何者时段为胎儿发育进行最多而且最激烈的改变?
 - 第一周
 - 第一个三个月 (first trimester.)
 - 第二个三个月 (second trimester)
 - 第三个三个月 (third trimester)
 - 第九个月
- 在一个理论食物链中包含草、蚱蜢、麻雀和鹰时, 蚱蜢是
 - 初级消费者 (primary consumers)
 - 初级生产者 (primary producers)
 - 次级消费者 (secondary consumers)
 - 次级生产者 (secondary producers)
 - 屑食者 (detritivores)
- 大部分动物当身体太热时, 下列何者为正常的生理反应?
 - 增加皮肤的血液流量
 - 心跳降低
 - 皮肤内的血管收缩
 - 肌肉收缩
 - 保留水分的消失
- 下列激素中何者调控植物顶芽 (shoots) 趋向光性反应 (phototropic responses)?
 - 生长素(auxins)
 - 赤霉素(gibberellins)
 - 细胞分裂素(cytokinins)
 - 脱落酸(abscisic acid)
 - 乙烯(ethylene)
- 当葡萄糖作为主要能量来源时, 产生最大量 ATP 之反应为何?
 - 糖酵解 (glycolysis)
 - 形成之乙酰辅酶 (acetyl CoA)
 - 克雷伯氏循环 (Krebs cycle)
 - 底物水平磷酸化 (substrate-level phosphorylation)
 - 电子传递磷酸化 (electron transport phosphorylation)
- 蔗糖 (sucrose) 之组成是
 - 两个果糖分子
 - 两个葡萄糖分子
 - 一个果糖分子和一个葡萄糖分子
 - 一个果糖分子和一个半乳糖分子
 - 两个半乳糖分子

8. 将遗传讯息从 RNA 转移至蛋白质的过程称为
- (a) 转录 (transcription)
 - (b) 转译 (translation)
 - (c) 启动 (initiation)
 - (d) 延长 (elongation)
 - (e) 复制 (replication)
9. 在细胞周期中时间最长的部分是
- (a) 前期 (prophase)
 - (b) G1 期
 - (c) G2 期
 - (d) 有丝分裂 (mitosis)
 - (e) 分裂期间 (interphase)
10. 如果父母双方都是一种致死隐性基因的携带者，他们的小孩将会有多少机率遗传并表现此毛病
- (a) 1/8
 - (b) 1/4
 - (c) 1/2
 - (d) $1/2 \times 1/2 \times 1/4$ or $1/16$
 - (e) $2/3 \times 2/3 \times 1/4$ or $1/9$
11. 有效治疗病毒感染的药物是因为它能
- (a) 诱导身体产生抗体
 - (b) 抑制病毒内核糖体的作用
 - (c) 干扰病毒内核酸的合成
 - (d) 改变宿主细胞上的识别点 (cell-recognition sites)
 - (e) 制造疫苗以刺激免疫系统反应
12. 天择 (natural selection) 最恰当的描述是
- (a) 优胜弱败
 - (b) 为生存而挣扎
 - (c) 最能适应环境的族群能成功繁殖后代
 - (d) 在自然资源有限的环境中过度繁殖后代
 - (e) 在一族群中改变可继承变量的比例
13. 在植物和动物种群中遗传变异 (genetic variation) 的最大来源是
- (a) 突变 (mutations)
 - (b) 性重组 (sexual recombination)
 - (c) 选择 (selection)
 - (d) 多态性 (polymorphism)
 - (e) 隐性掩蔽杂合子 (recessive masking heterozygotes)

14. 下面何种植物细胞在功能完全成熟时是会死亡?
- (a) 管胞 (tracheids)
 - (b) 木栓细胞 (cork cells)
 - (c) 导管元 vessel elements
 - (d) 厚壁细胞 (sclerenchyma cells)
 - (e) 以上皆是
15. 提供植物有机体大部份质量的无机化合物是
- (a) H_2O
 - (b) CO_2
 - (c) NO_3^-
 - (d) O_2
 - (e) $C_6H_{12}O_6$
16. 下列何种不属于器官系统的一种?
- (a) 骨骼 (skeleton)
 - (b) 结缔组织 (connective)
 - (c) 消化系统 (digestive)
 - (d) 排泄系统 (excretory)
 - (e) 免疫及淋巴系统 (immune and lymphatic)
17. 不完全蛋白质是
- (a) 缺乏必需维生素 (essential vitamins)
 - (b) 营养不良的一种原因
 - (c) 在肉, 蛋, 及奶酪中所发现的
 - (d) 缺乏一个或多个必需氨基酸 (essential amino acids)
 - (e) 蔬菜过渡煮熟的一种结果
18. 艾滋病 (AIDS) 是通过何种方式传染到的, 请示之
- (a) 唾液
 - (b) 一起用餐
 - (c) 与患艾滋病者有性关系
 - (d) 皮肤接触
 - (e) 空气
19. 下面所列都是脊椎动物肝脏的功能, 除了
- (a) 药物和毒素的解毒
 - (b) 血浆蛋白的合成
 - (c) 葡萄糖和肝糖的转换
 - (d) 尿液的合成
 - (e) 胆汁的合成

20. 下列何种激素 (hormones) 不参与血糖浓度的增加?
- (a) 升糖素 (glucagon)
 - (b) 肾上腺素 (epinephrine)
 - (c) 糖皮质激素 (glucocorticoids)
 - (d) ACTH (促肾上腺皮质激素)
 - (e) 胰岛素
21. 人类女性通常在身体何处出现受精情形?
- (a) 卵巢 (ovary)
 - (b) 输卵管
 - (c) 子宫
 - (d) 子宫颈 (cervix)
 - (e) 阴道
22. 下列有一句话对棕油的描述是不正确的, 请指出来:
- (a) 马来西亚的棕油是由油棕果核压榨出来的
 - (b) 它是一种高温油
 - (c) 它是原产地是在非洲
 - (d) 它的经济寿命约有 25 年
 - (e) 它每年为我国赚取很多外汇
23. 下列何种生态层次考虑有能量转动及化学循环?
- (a) 群落 (community)
 - (b) 生态系统 (ecosystem)
 - (c) 有机体圈 (organismal)
 - (d) 种群 (population)
 - (e) 非生物圈 (abiotic)
24. 打架比较会出现在下述哪种情况, 请示之。
- (a) 同一物种中的雄性之间
 - (b) 不同物种中的雄性之间
 - (c) 同一物种中的雌性之间
 - (d) 不同物种中的雌性之间
 - (e) 同一物种中的雄性与雌性之间
25. Endau Rompin 国家公园 (National Park) 是在马来西亚国家那一州内?
- (a) Perak
 - (b) Pahang
 - (c) Johor
 - (d) Sabah
 - (e) Sarawak

1. Which of the following are characteristic of vertebrates?
 - (a) a skull
 - (b) the backbone of vertebrates consists of bone
 - (c) can move
 - (d) all of the above
 - (e) both a and c
2. During which of the following periods of gestation does a developing human undergo the most numerous and most radical changes?
 - (a) first week.
 - (b) first trimester.
 - (c) second trimester
 - (d) third trimester
 - (e) ninth month
3. In a hypothetical food chain consisting of grass, grasshoppers, sparrows, and hawks, the grasshoppers are
 - (a) primary consumers
 - (b) primary producers
 - (c) secondary consumers
 - (d) secondary producers
 - (e) detritivores
4. Which of the following is a physiological response that takes place in many animals when they get too hot?
 - (a) increase blood flow to the skin
 - (b) slowing of the heart rate
 - (c) constriction of blood vessels in the skin
 - (d) constriction of muscles
 - (e) retention of water
5. Which of the following types of hormones mediates the phototropic responses of shoots?
 - (a) Auxins
 - (b) gibberellins
 - (c) cytokinins
 - (d) abscisic acid
 - (e) ethylene

6. When glucose is used as the energy source, the largest amount of ATP is produced in
 - (a) glycolysis.
 - (b) acetyl CoA formation.
 - (c) the Krebs cycle
 - (d) substrate-level phosphorylation
 - (e) electron transport phosphorylation.
7. Sucrose is composed of
 - (a) two molecules of fructose
 - (b) two molecules of glucose
 - (c) a molecule of fructose and a molecule of glucose
 - (d) a molecule of fructose and a molecule of galactose
 - (e) two molecules of galactose
8. The transfer of genetic information from RNA to protein is called
 - (a) Transcription
 - (b) translation
 - (c) initiation
 - (d) elongation
 - (e) replication
9. The longest part of the cell cycle is
 - (a) Prophase
 - (b) G1 phase
 - (c) G2 phase
 - (d) mitosis
 - (e) interphase
10. If both parents are carriers of a recessive gene, the probability that their child will inherit and express the disorder is
 - (a) $1/8$
 - (b) $1/4$
 - (c) $1/2$
 - (d) $1/2 \times 1/2 \times 1/4$ or $1/16$
 - (e) $2/3 \times 2/3 \times 1/4$ or $1/9$
11. Drugs that are effective in treating viral infections
 - (a) induce the body to produce antibodies.
 - (b) inhibit the action of viral ribosomes.
 - (c) interfere with the synthesis of viral nucleic acid.
 - (d) change the cell-recognition sites on the host cell.
 - (e) produce vaccines that stimulate the immune system.

12. The best descriptive of natural selection is
- (a) the survival of the fittest.
 - (b) the struggle for existence.
 - (c) the reproductive success of the members of a population best adapted to the environment.
 - (d) the overproduction of offspring in environment with limited natural resources.
 - (e) a change in the proportion of inheritable variations within a population.
13. The greatest source of genetic variation in plant and animal population is from
- (a) mutations
 - (b) sexual recombination
 - (c) selection
 - (d) polymorphism
 - (e) recessive masking heterozygotes
14. Which of the following cells are dead at functional maturity?
- (a) tracheids
 - (b) cork cells
 - (c) vessel elements
 - (d) sclerenchyma cells
 - (e) all of the above
15. The inorganic compound that contributes most of the mass to a plant's organic matter is
- (a) H_2O
 - (b) CO_2
 - (c) NO_3^-
 - (d) O_2
 - (e) $C_6H_{12}O_6$
16. Which of the following that does not belong to an organ system?
- (a) skeletal
 - (b) connective
 - (c) digestive
 - (d) excretory
 - (e) immune and lymphatic
17. Incomplete proteins are
- (a) lacking in essential vitamins
 - (b) a cause of undernourishment
 - (c) found in meat, eggs, and cheese
 - (d) lacking in one or more essential amino acids
 - (e) a results of overcooking vegetables

18. AIDS may be transmitted by the following ways:
- (a) saliva
 - (b) dining together
 - (c) have sex with the virus carrier
 - (d) skin contact
 - (e) through air
19. All of the following are functions of the vertebrate liver except
- (a) detoxification of drugs and toxins
 - (b) synthesis of plasma proteins
 - (c) interconversion of glucose and glycogen
 - (d) synthesis of urine
 - (e) synthesis of bile
20. Which of the following hormones is not involved with the increasing the blood glucose concentration?
- (a) glucagon
 - (b) epinephrine
 - (c) glucocorticoids
 - (d) ACTH (adrenocorticotropic hormone)
 - (e) Insulin
21. In which location does fertilization usually take place in a human female?
- (a) ovary
 - (b) oviduct
 - (c) uterus
 - (d) cervix
 - (e) vagina
22. Please point out a statement which does not correctly describe palm oil.
- (a) Palm oil is the oil extract from palm kernel fresh fruit
 - (b) Its boiling point is high compared with other cooking oils
 - (c) The crop was originated from West Africa
 - (d) The economic life is 25 years
 - (e) It contributes a lot to the national economy
23. Which level of ecology considers energy and chemical cycling?
- (a) community
 - (b) ecosystem
 - (c) organismal
 - (d) population
 - (e) abiotic

24. Fighting is more likely to occur between
- (a) males of the same species
 - (b) males of different species
 - (c) females of the same species
 - (d) females of different species
 - (e) males and females of the same species
25. Endau Rompin National Park is located at which state, Malaysia.
- (a) Perak
 - (b) Pahang
 - (c) Johor
 - (d) Sarawak
 - (e) Sabah