**INSTRUCTION:** Select the **SINGLE BEST** response to the following questions from options A-E.

1. The notochord develops from which of the following structures?

A. Extraembryonic mesoderm

B. Primitive streak

C. Primitive knot

D. Endoderm

E. Neural groove

2. Which is the part in the **caudal** region of the embryo where ectoderm and endoderm remain in direct contact during the formation of the trilaminar disc?

A. Buccopharyngeal membrane

B. Primitive knot

C. Primitive streak

D. Prochordal plate

E. Cloacal membrane

3. Which mesoderm contributes to the formation of the amniotic membrane in an embryo?

A. Splanchnopleuric

B. Somatopleuric

C. Lateral plate

D. Intermediate

E. Paraxial

4. Which structure in the trilaminar embryonic disc induces the formation of the neural plate?

A. Endoderm

B. Notochord

C. Extra-embryonic mesoderm

D. Intra-embryonic mesoderm

E. Primitive streak

5. Which of the following forms the floor of the amniotic cavity?

A. Amniotic membrane

B. Intraembryonic mesoderm

C. Extraembryonic mesoderm

D. Ectoderm

E. Endoderm

6. Which of the following structures becomes partly enclosed within the body stalk (umbilical cord)?

A. Extraembryonic coelom

B. Amniotic cavity

C. Yolk sac

D. Intervillous space

E. Chorion

7. Which of the following spaces does the enlargement of the amniotic cavity in the course of foetal development directly obliterate?

A. Yolk sac

B. Lacunae

C. Blastocyst

D. Extraembryonic coelom

E. Uterine cavity

8. The usefulness of embryology to a medical student includes ALL of the

EXCEPT

A. Provision of rational explanation for the position of many normal adult structures.

B. Knowledge of development and relationship of foetal membranes facilitates their study in obstetrics.

C. Facilitation of understanding of congenital abnormalities.

D. Understanding of hormonal deficiencies in people.

E. Correlation of other morphological disciplines.

9. The placenta produces ALL of the following hormones EXCEPT:

A. Luteinizing hormone (LH)

B. Human chorionic gonadotrophin (HCG)

C. Human chorionic somatomammotrophin (HCS)

D. Progesterone

E. Oestrogens

10. Which of the following is NOT included in structures constituting the foetal membranes?

A. Amniotic membrane

B. Yolk sac  
C. Hypoblast  
D. Umbilical cord  
E. Placenta

11. Which is the stem cell in the spermatogenic lineage?

A. Spermatid

B. Type A spermatogonium

C. Type B spermatogonium

D. Primary spermatocyte

E. Secondary spermatocyte

12. The functions of amniotic fluid includes ALL of the following EXCEPT:

A. Prevention of foetal dehydration

B. Prevention of foetal attachment to amnion

C. Facilitation of foetal movements

D. Acting as a shock absorber

E. Provision of hydrostatic force that gently dilates the cervix during parturition.

13. Which is the first layer that differentiates from the embryoblast?

A. Amnion

B. Chorion

C. Endoderm

D. Ectoderm

E. Mesoderm

14. Which of the following mesodermal layers gives rise to somites in the embryo?

A. Lateral plate

B. Paraxial

C. Intermediate

D. Somatic

E. Splanchnic

15. Which is the hormone directly responsible for ovulation?

A. Gonadotrophin releasing hormone

B. Follicle stimulating hormone

C. Luteinizing hormone

D. Oestrogen

E. Progesterone

16. Which hormone is directly responsible for the maintenance of the corpus luteum of menstruation?

A. Follicle stimulating hormone

B. Luteinizing hormone

C. Human chorionic gonadotrophin

D. Human chorionic somatomammotrophin

E. Human chorionic thyrotrophin

17. Which hormone is directly responsible for maintenance of the corpus luteum of pregnancy?

A. Human chorionic gonadotrophin

B. Human chorionic thyrotrophin

C. Human chorionic somatomammotrophin

D. Follicle stimulating hormone

E. Luteinizing hormone

18. In Assisted Reproductive Technology (ART) a conceptus is introduced into the uterus of a hormonally stimulated female at which stage of development?

A. Two-cell stage

B. Four-cell stage

C. Eight-cell stage

D. Sixteen-cell stage

E. Thirty-two cell stage

19. Which of the following is the reason for the hormones contained in the female contraceptive pill?

A. Suppression of menstruation

B. Inhibition of spermatogenic acrosomal reaction

C. Stimulation of zona reaction of ovum before sperms reach it

D. Suppression of hypothalamic secretion of gonadotrophin releasing hormone

E. Suppression of female orgasm during coitus

20. In cloning, an enucleated oocyte of a mature ovarian follicle is needed for ALL of the following reasons EXCEPT:

A. Protection by cells of corona radiate

B. Presence of zona pellucida

C. Cytoplasmic enzymes that drive cleavage division

D. Cell membrane sensitive to hormones of pregnancy

E. None of the above

**SECTION B**

**INSTRUCTIONS:** Indicate whether the statements below are **True (T)** or **False (F)** with specific reference to the stem statements preceding them.  Encircle the appropriate letter to indicate your choice.

21. – 25. **Concerning assisted conception or in vitro fertilization (IVF), evaluate the following statements.**

21. T-F A woman who has had a previous bilateral ovariectomy requires donor ova to take advantage of IVF procedure.

22. T-F A man diagnosed with oligospermia can benefit from IVF procedure using his own spermatozoa.

23. T-F A man who has had a vasectomy can benefit from IVF procedure using his own spermatozoa.

24. T-F A man diagnosed with azoospermia can benefit from IVF procedure using his own

spermatozoa.

25. T-F A woman who has had a previous hysterectomy requires donor ova to take

advantage of  IVF procedure.

26. – 28. **Which of the following is a direct consequence of fertilization during normal development?**

26. T-F Formation of the blastocyst.

27. T-F Introduction of genetic variation in the species.

28. T-F Completion of the second meiotic division of the oocyte.

29. – 33**. The following abnormal phenomena can prevent successful coitus, and/or**

**availability of competent gametes for fertilization.**

29. T-F Hazardous vaginal secretions caused by altered chemical composition owing to the

presence of pathogenic bacteria.

30. T-F Psychological factors in the male that cause premature ejaculation or impotence.

31. T-F Failure of the female partner to have an orgasm during coitus.

32. T-F Immotile cilia (Kartagener’s) syndrome in the male.

33. T-F Tuberculosis in the female that causes narrowing or blockage of her urethra.

34. – 38. **Concerning oogenesis, evaluate the following statements.**

34. T-F Primordial follicles do not undergo atresia (degeneration).

35. T-F Primary follicles contain primary oocytes arrested in the prophase of the first meiotic division.

36. T-F At ovulation the gamete that is expelled is a secondary oocyte.

37. T-F Release of the oocyte during ovulation is under the direct influence of luteinizing hormone (LH).

38. T-F Oral contraceptive pills promote follicular maturation but suppress ovulation.

39. – 43**. Evaluate the following statements with regards to recent advances in the cloning of mammals**.

39. T-F Blastomeres at the 4-cell stage can be used to produce 4 clones of the same animal.

40. T-F Blastomeres at the 16-cell stage can be used to produce 16 clones of the same animal.

41. T-F As many donor ova are required as the number of clones to be created.

42. T-F Clones produced by nuclear transplantation have cytoplasmic components that

are different from their parents.

43. T-F The uterine environment of clones borne by the same surrogate mother in

successive pregnancies is different.

44. – 48. **Fraternal twin foetuses have the following features arising from their formation**

**during fertilization and implantation.**

44. T-F They develop from a single ovum.

45. T-F They may have a single placenta.

46. T-F They may develop from two different oocytes that ovulate from the same ovary at the

same time.

47. T-F They never have different sexes.

48. T-F They have a single umbilical cord.

49. – 55. **Evaluate the following statements based on events preceding, during, and**

**after implantation.**

49. T-F The zona pellucida disintegrates soon after implantation.

50. T-F Adherence and attachment to maternal tissue occurs at the pole where embryoblast is

in contact with trophoblast.

51. T-F In the early stages, decidua capsularis is located between the conceptus and

myometrium.

52. T-F Chorion leave forms in contact with decidua capsularis.

53. T-F The endometrium is in the secretory phase when implantation commences.

54. T-F After implantation the endometrium enters the decidual phase of development.

55. T-F The foetal tissue that is in direct contact with maternal tissue is the cytotrophoblast.

56. – 66. **The following statements are correct in respect of oogenesis.**

56. T-F There is no mitotic division in the gametes after birth.

57. T-F All oocytes present after birth have commenced the first meiotic division.

58. T-F The process is never permanently terminated in a lifetime.

59. T-F The primary oocyte in a primordial follicle contains 23 chromosomes.

60. T-F The secondary oocyte released at ovulation contains 23 pairs of chromosomes.

61. T-F The secondary oocyte released at ovulation contains fourfold the amount of DNA

(4N) in a haploid cell.

62. T-F The second meiotic division of the secondary oocyte (ovum) is not necessary since it

already contains only 23 chromosomes.

63. T-F The polar bodies released at each meiotic division contain 46 chromosomes each.

64. T-F  The female pronucleus produced after the second meiotic division of the secondary

oocyte (ovum) determines the genetic sex of the foetus.

65. T-F The secondary oocyte (ovum) released at ovulation has either Y- or X-bearing

chromosome.

66. T-F The secondary oocyte (ovum) released at ovulation remains viable in the ovarian

tubes for 14 days.

66. – 84 **Concerning the cells in the spermatogenic lineage, the following statements are**

**correct.**

66. T-F Spermatids have 46 chromosomes.

67. T-F Spermatozoa have 23 chromosomes.

68. T-F Primary spermatocytes have 46 chromosomes.

69. T-F Secondary spermatocytes have 23 chromosomes.

70. T-F Type-A spermatogonia have 23 chromosomes.

71. T-F Type-B spermatozoa have 46 chromosomes.

72. T-F Type-A spermatogonia undergo mitotic division.

73. T-F Type-B spermatogonia undergo meiotic division.

74. T-F Primary spermatocytes undergo mitosis.

75. T-F Secondary spermatocytes undergo meiosis.

76. T-F Spermatids undergo meiosis.

77. T-F Spermatozoa undergo spermatogenesis.

78. T-F Spermatids undergo cytodifferentiation known as spermiogenesis.

79. T-F When type-A spermatogonia divide they produce both type-A and type-B

spermatogonia.

80. T-F When type-B spermatogonia divide they produce primary spermatocytes.

81. T-F Primary spermatocytes produce spermatids when they divide.

82. T-F Spermatids produce secondary spermatocytes when they divide.

83. T-F Spermatids are spherical or tadpole-shaped cells.

84. T-F Spermatozoa in the epididymis multiply by mitotic division.

85. – 89. **Identical twin foetuses have the following features arising from their formation**

**during fertilization and implantation.**

85.T-F They may develop from two secondary oocytes simulatenously released at ovulation.

86. T-F They may have a single placenta.

87. T-F They may have a single amniotic cavity

88. T-F They always have the have the same sex.

89. T-F They are dizygotic.

90. – 94 **Capacitation of spermatozoa involves the following**

90. T-F removal of specific glycoproteins from membrane covering acrosomal cap.

91. T-F perforations in membrane covering acrosomal cap.

92. T-F release of proteases from acrosomal cap.

93. T-F detachment of acrosomal cap to expose membrane covering sperm head.

94. T-F high levels of progesterone

95. – 99. **An obstetrician is concerned when examination of a delivered placenta shows**

**missing tissue, because**

95. T-F Retained tissue may interfere with myometrial contraction

96. T-F Possibility of post-partum (puerperal) haemorrhage (PPH)

97. T-F Possibility of infection when retained tissue rots

98. T-F Proliferation of retained tissue may give rise to choriocarcinoma.

99. T-F All of the above.

100 – 104 **The event that directly causes the placenta to detach and be expelled from the**

**uterine wall during the third stage of labour is**

100. T-F Inability of the placenta to accommodate itself on a decreased surface area as the

uterus  shrinks in size.

101. T-F Rupture of the hydrostatic wedge of amniotic membrane that dilates the cervix.

102. T-F Ligation and cutting of the umbilical cord.

103. T-F Traction exerted on it whilst the baby is being expelled from the uterus.

104. T-F Cessation of blood supply to the placental bed after the baby has been delivered.

105 – 109 **The “abortion” emergency contraceptive pill RU486 works by blocking**

**endometrial development necessary to support pregnancy, as well as causing**

**dilation of the cervix and promoting uterine contraction that expels an**

**implanted conceptus.   RU486 directly antagonize the following hormones**

105. T-F Human chorionic gonadoptrophin

106. T-F Human chorionic somatomammotrophin

107. T-F Relaxin

108. T-F Progesterone

109. T-F Oestrogen

110 – 114 **Concerning the hormone progesterone produced by the placenta, evaluate the**

**following statements.**

110. T-F Routine pregnancy tests determine presence or otherwise in a pregnant woman’s

urine.

111. T-F It maintains the endometrium in a thickened condition.

112. T-F Contractility of uterine smooth muscle is suppressed by it throughout pregnancy.

113. T-F Secretion of pituitary gonadotrophins is inhibited by it.

114. T-F It strengthens the mucus plug covering the cervix to prevent infection.

115 – 200 **The following statements are correct about human chorionic gonadotrophin**

**produced by the placenta.**

115. T-F It is often called the hormone of pregnancy because of the critical role it plays in

maintaining the endometrium in the state necessary for embryonic development.

116. T-F It acts on the same receptors as Luteininzing hormone (LH).

117. T-F Serves as signal for maternal recognition of pregnancy.

118. T-F Serves as signal for maternal recognition of pregnancy

119. T-F Cytotrophoblast cells of the placenta are responsible for its secretion.

200.T-F Produced in excessively high levels in hydatiform molar pregnancy.

201 – 205 **Human chorionic somatommamotrophin (HCS) is:**

201. T-F Also known as human placental lactogen (hPL).

202. T-F Hormone credited with initiating breast development.

203. T-F Antagonistic to pituitary growth hormone.

204. T-F A stimulator of foetal growth.

205. T-F Regulated by oestrogen.

206 – 210 **Regarding the effects of placental oestrogens, evaluate the following statements.**

206. T-F High levels late in pregnancy upregulates myometrial oxytocin receptors that prepare

uterus for parturition.

207. T-F It maintains the endometrium.

208. T-F Foetal bone density is regulated by it.

209. T-F Responsible for promotion of blood flow within uterus.

210. T-F Suppresses secretion of pituitary gonadotrophins.

211 – 215 **Implantation occurs at the following stages**

211. T-F Zygote

212. T-F Sixteen-cell

213. T-F Sixty-four cell

214. T-F Blastocyst

215. T-F Bilaminar

216 – 220 **Around the peri-implantation period, the endometrium is**

216. T-F Proliferating

217. T-F Decidualized

218. T-F Secretory

219. T-F None of the above

220. T-F All of the above

221 – 225 **Binding of the sperm head to the ovum during fertilization is facilitated by**

221. T-F Hyaluronidase

222. T-F Acrosin

223. T-F Neuraminidase

224. T-F ZP3

225. T-F Zona reaction

226 – 230 **All of the following are reasons for permitting emergency contraceptive use, EXCEPT:**

226. T-F A couple who plan for a baby may change their mind.

227. T-F Condoms being used for contraception may tear

228. T-F Women on contraceptive pills may forget to take them

229. T-F Contraceptive diaphragms may slip

230. T-F Coitus may be forced as in rape or incest.

231 – 235 **The “morning after” emergency contraceptive pill works by delivering a large dose of oestrogen within 72 hours of coitus.  The following explains how it works**

231. T-F If an ovulation has not recently occurred, it prevents the ovum from being released.

232. T-F If an ovum has been released, its fertilization may be impaired.

233. T-F If fertilization has already occurred, implantation is inhibited

234. T-F Cleavage division and production of the blastocyst is adversely affected.

235. T-F If implantation has already occurred, the embryo is dislodged.

236 – 240 **Female factors that account for infertility includes of the following EXCEPT:**

236. T-F Bilateral blocked oviducts

237. T-F High acidity of vaginal fluid

238. T-F Hostile cervical mucus

239. T-F Endometriosis

240. T-F anovulation and luteal phase defect

241 – 245 **The embryonic process that involves morphogenetic movement of cells is**

241. T-F Implantation

242. T-F Fertilization

243. T-F Acrosomal reaction

244. T-F Decidualization

245. T-F Gastrulation

246 – 250 **The mesoderm  which gives rise to the somites after the formation of the**

**trilaminar disc in the developing embryo is**

246. T-F Splanchnopleuric

247. T-F Somatopleuric

248. T-F Lateral plate

249. T-F Intermediate Paraxial

250. T-F Paraxial

251 – 255 **The following structures constitute the foetal membranes EXCEPT**

251. T-F Amniotic membrane

252. T-F Yolk sac

253. T-F Hypoblast

254. T-F Umbilical cord

255. T-F Placenta

256 – 260 **The notochord develops from the following structures**

256. T-F Extraembryonic mesoderm

257. T-F Primitive streak

258. T-F Primitive knot

259. T-F Endoderm

260. T-F Neural groove

261 – 265 **The placenta produces ALL of the following hormones EXCEPT:**

261. T-F Luteinizing hormone (LH)

262. T-F Human chorionic gonadotrophin (HCG)

263. T-F Human chorionic somatomammotrophin (HCS)

264. T-F Progesterone

265. T-F Oestrogens

266 – 270 **The maternal and foetal components of the placenta are**

266. T-F Decidua basalis and Chorion frondosum respectively

267. T-F Decidua capsularis and Chorion leave respectively

268. T-F Decidua parietalis and Decidua capsularis respectively

269. T-F Chorion leave and Decidua parietalis respectively

270. T-F Decidua basalis and Chorion leave respectively

271 – 275 **The focal point in the caudal region of the embryo where ectoderm and**

**endoderm remain in direct contact after gastrulation is**

271. T-F Prochordal plate

272. T-F Primitive knot

273. T-F Primitive streak

274. T-F Oropharyngeal membrane

275. T-F Cloacal membrane

276 – 280 **The following arise from neural crest cells**

276. T-F Melanocytes

277. T-F Schwann cells

278. T-F Medullary cells of suprarenal gland

279. T-F Dermatomes

280. T-F Dorsal root ganglionic cells

281 – 285 **The following structures becomes partly enclosed within the body stalk**

**(umbilical cord).**

281. T-F Extraembryonic coelom

282. T-F Amniotic cavity

283. T-F Yolk sac

284. T-F Intervillous space

285. T-F Chorion

286 – 290 **The last layer in a trilaminar embryonic disc to develop is**

286. T-F Ectoderm

287. T-F Endoderm

288. T-F Extra-embryonic mesoderm

289. T-F Intra-embryonic mesoderm

290. T-F None of the above